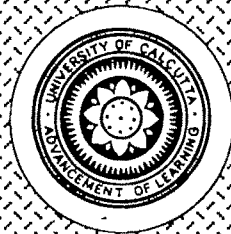
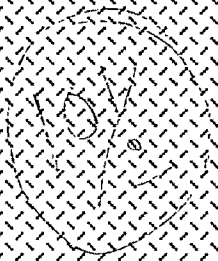


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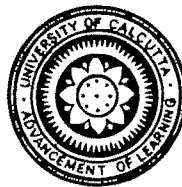
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EDITORIAL

The department had great pleasure in bringing out the first Journal after seventy four years of its inception. The occasion was celebrated in a befitting manner with the auspicious presence of the Vice-Chancellor, the Pro-Vice-Chancellors, the Dean of Science, Secretary of Science and dignitaries from this and other Universities and Institutes. The Journal was released by Prof. R.N. Basu, the Vice-Chancellor. Prof. Basu had expressed his pleasure over the activities and development of the academic affairs of this department. Prof. Bharati Ray, Pro-Vice-Chancellor (Academic Affairs) and Prof. P.N. Roy the Pro-Vice-Chancellor (Business, Administration and Finance) spoke on the occasion. They highlighted the importance of the departmental journal in the academic and research activities of the department. The Vice-Chancellor had gone through the articles of the journal and gave a critical appraisal of the Journal. He further discussed the possibilities of inclusion of articles from scholars other than the faculty members of this department. The editor conceded that time was not adequate for inviting papers outside the faculty. Circular had been sent to other universities and organisation prior to the publication of the second volume of the journal.

The first volume of the journal had been accepted by the learned bodies both in India and abroad. Exchange programme had been established with journals and bulletins published by other universities and Institutes both foreign and Indian.

The department had seen quite a few development and change. With the Departmental Special Assistance programme academic side had made great progress and research work is going on in an accelerated manner. Laboratories are equipped with modern equipments. Library is enriched with new books.

A national seminar was organised and held on March 30, '94. Fund was provided by the University. The theme of the seminar was "Man and Environment, with special emphasis on Tribals of Eastern India". Scholars from universities and research organisations actively participated in the seminar. One day seminar was a success. The lecture theatre remained packed till the end.

The department had collaborated with Universities and learned societies for seminar, lecture and other endeavours, such as the Indian Anthropological society, Anthropological Survey of India, School of tropical medicine, Indian Statistical Institute, Delhi University, Indian Institute of Bio-Social Research, School of Human Genetics and population health, Prof. K.P. Chattopadhyay Memorial Committee.

All the backlogs of the examinations had been cleared. The examinations of 1994 were held on time. The department has prospered in all ways with the support and patronage of the administrative heads of the University and members of the department.

The first volume was in no-way perfect. All effort is given to make this volume free of error.

Ranjana Ray

**The Hoabinhian 60 years After Madeleine Colani:
Anniversary Conference — Ha Noi
28 December 1993 — 3 January 1944**

WILHELM G. SOLHEIM II

The Hoabinhian Conference, held in honor of Madeleine Colani in Ha Noi, was in many ways a model for what a relatively small, sharply focused, international conference should be. When I was in Ha Noi in October 1982 we talked about the need for such a small conference. At that time we considered "small" as about 20 people, half of them from Viet Nam. The purpose of the conference was to focus on a new definition of the Hoabinhian and a standardization of terms for the different tool types associated with the Hoabinhian and Bacsonian cultures. In this conference small changed to "relatively small," with 80 listed participants, of which 25 were from Viet Nam. The "First Announcement" stated that "The objective of the Conference is to try to redefine the Hoabinhian terminology in the light of the new discoveries made during the last 60 years in Southeast Asia....." Besides from Viet Nam, participants came from Australia, Canada, England, France, Germany, Hong Kong, Indonesia, Japan, Kenya, Laos, Malaysia (West), Myanmar (Burma), Nepal, Northern Ireland, People's Republic of China, Sarawak (East Malaysia), Taiwan, Thailand, and U.S.A.

The sponsors of this conference were : The Institute of Archaeology, Ha Noi, Viet Nam, The Ministry of Foreign Affairs, Paris, France, and SPAFA (SEAMEO Project in Archaeology and Fine Arts). The Coordination Committee, which did such a good job, was made up of Prof. Ha Van Tan/Dr Nguyen Van Binh for Viet Nam, Dr Marielle Santoni for France, and Dr Surin Pookajorn for SPAFA.

The first full day of the conference started with a visit to the National History Museum in Ha Noi. The opening speeches came after lunch, followed by the first session of papers, chaired by Marielle Santoni—who, incidentally, was the primary, day to day leader of the program. The evening of that first day we were entertained for dinner by the sponsors.

Surin Pookajorn chaired the second morning's session. Eight papers were presented with 20 minutes per paper, sometimes with a few minutes for discussion and other times without time for discussion. The morning's presentation was broken in the middle for a short coffee-break. I chaired the afternoon session, with eleven papers and two breaks. The papers of the first full day were concerned with Hoabinhian tools, specific sites, chronology, and general papers. The presentation that probably elicited the most interest during the conference was by Somsal Pramankij who demonstrated the manufacture of typical Hoabinhian tools using selected river cobbles. No one was prepared for what happened. He held the selected cobble in his left hand, and with a hammerstone in his right he made three sharp blows to the cobble in three seconds, and the tool was completed. It was astonishing. With this technique a good Sumatralith would not take more than ten seconds to make. It was obvious that the most time needed in making Hoabinhian stone tools was the selection of the right size and shape cobble. The next morning session, chaired by Ha Van Tan, saw the presentation of eight papers on South China. While the Chinese do not use the term Hoabinhian or Bacsonian, it is obvious that very similar cultures

are found in South China. The afternoon session, chaired by Richard Shutler, had papers on Hoabinhian like sites or industries found outside of Viet Nam and Thailand.

The final morning of papers, chaired by RP Soejono, was concerned with the human, faunal, and floral remains found in Hoabinhian sites. That afternoon we had our discussion on redefining the "Hoabinhian," and at times the discussion was animated, to say the least. Some had expressed, at this conference and elsewhere, that the concept of the Hoabinhian was so ill defined that it would be best to no longer use it. A comment made earlier in the program by Daniel Styles of the British Institute in Eastern Africa, in Kenya, I feel, had a telling effect on this topic. He said that he had virtually no knowledge of the Hoabinhian before he came to this conference, but that he did have a good background on stone tools of this time period in Africa and the Middle East. His feeling was that the "Hoabinhian" was a distinct entity, when seen in relation to the other stone technologies of the world, and that he felt it was a worthwhile concept, with meaning. No discussion took place on tossing out the "Hoabinhian" concept.

Joyce White, from the University of Pennsylvania, was the leader of the discussion. While our conclusions are not binding, and were arrived at through a vote on each of six subjects, no vote tally, except possibly the first one, was unanimous. These were as follows : 1) retain the use of the term "Hoabinhian;" 2) with the choice of the best concept for "Hoabinhian" among: a) culture, b) technocomplex, or c) industry, we voted for c) an industry; 3) for chronology we accept that the Hoabinhian industry dates from "late-to-terminal Pleistocene to early-to-mid Holocene;" 4) retain the use of the term "Sumatralith;" 5) refer to the Hoabinhian Industry as a "cobble," rather than "pebble," tool industry; and finally, 6) do *not* refer to the Hoabinhian as a "Mesolithic" phenomenon

One evening during the conference we were given a reception by the French Embassy, which provided pleasant relaxation after two days of continuous papers. The day following the final discussion we had a most enjoyable excursion to Hoah Binh Province. There we visited two of the first Hoabinhian sites discovered and excavated by Madeleine Colani. We then visited a rather traditional mountain village, and were entertained with traditional music, and food, and were able to buy local handmade cloth and other artifacts. On our return to Ha Noi we stopped in Hoa Binh, the provincial capitol and were given a snack by the Deputy Governor of the province and the Mayor. As we departed each of us was presented two bottles of locally made rice wine.

The 2nd of January we were able to visit the Vietnamese Institute of Archaeology where Hoabinhian collections, and artifacts from other Viet Nam sites, were laid out for inspection and discussion. The final day was free, with many of us on our way to Bangkok and then the IPPA Congress in Chiang Mai.

Secular Regression In Stature Among The Mahishya Caste Population Of West Bengal : A Case For Microevolution

D. P. MUKHERJEE. AND D. MUKHOPADHYAY

Abstract - The concept of a universal secular trend of cumulative increase in stature has been challenged by data from India and Africa demonstrating negative secular trends in stature as well. The reasons for this negative or even positive secular trend are not yet precisely understood, although indications of directional selection or inbreeding effects have been obtained in specific instances.

We have also observed a negative secular trend in stature in the multichronic series of published and unpublished data for the Mahishya caste population which is distributed in several districts of West Bengal. A critical study among the Mahishya has revealed a microevolutionary process underlying the temporal regression in stature, which is outlined in this paper.

INTRODUCTION

A trend of cumulative increase in body size through generations for over 150 years has been reported from northwestern Europe (Boyne et al 1957), North America (Bowles 1932) and Japan (Suzuki 1957). This secular increase in adult stature is considered to be a remarkable phenomenon of present day human biology (Tanner 1977). But its mechanism is not yet fully understood, although several authors have suggested a host of possible environmental and genetical factors. Kaplan (1954) proposed the operation of a single evolutionary force leading to uniform world wide increase in adult stature in *Homo sapiens*.

But Ganguly and Pal (1974) have challenged this hypothesis and have focussed our attention to a regression in average stature in 17 out of 20 Indian tribes and castes who were re-studied after an interval of at least 25 years. They have conceded that nutritional deficiencies recorded by Anthropological Survey of India, ICMR and NIN in several Indian populations might have resulted in stunted growth in them. But they did not find any evidence whatsoever of a gradual deterioration of nutritional status which might have caused a negative secular trend in any of them. In the apparent absence of enhanced inbreeding in these populations as well, these authors have referred to some Italian data showing earlier mortality of relatively shorter men (Conterio and Cavalli-Sforza, 1967), and have suggested that relaxation of such a selection, if any, in India, due to a general decline in mortality might explain the falling off of the average stature.

While Ganguly and Pal have proposed that the dominant secular trend in India is towards a reduction of stature, they have also noted a secular increase in stature in the pastoral Toda tribe. Studies have also shown a broad relationship between stature and economy at the population level cutting across ethnic and geographical boundaries in India (Rakshit 1970, Mukherjee 1978, 1984). In view of a well known strong genetic influence on stature, a part of this association can be attributed to genetical adaptation. In fact, a selective diversification of body dimensions has recently been observed among different isolates of the Yanadi tribe of Andhra Pradesh representing different subsistence economies (Srinivasulu 1991).

A positive selection for short stature through differential offspring survival has, again, been detected in a small isolated section of the Boya caste population of Kurnool district, Andhra Pradesh (Mukherjee and Shanta Devi 1977). Tobias (1985) has informed us about a similar

negative secular trend in stature among the Kung Bushmen of South Africa. Meanwhile, the decline in stature has also been confirmed from a number of Indian populations with high inbreeding coefficients (Mukherjee and Lakshmanudu 1977; Lakshmanudu 1980; Mukherjee 1984; A. Mukherjee 1985). How far microevolutionary factors like isolation and selection can provide a causal explanation for the secular trend in stature has been critically examined here among the Mahishya population, a widely distributed social caste in southern West Bengal.

DATA AND PROCEDURE

The analysis is based on (i) available estimates of means and SD's of stature of Mahishya males; (ii) height, education, per capita monthly expenditure (PCME), live-births and surviving children in Mahishya families of Singur, Hooghly district; and (iii) results suggesting lineage and local endogamy in Mahishyas of different areas.

Temporal and local differences in stature are critically examined. To assess how far economy explains the local differences, mean heights of men and women of Singur are compared with those of Amta (Howrah district) within the high (H), middle (M) and low (L) economic status (ES) on the criterion of PCME of Rs. 50 to 99 for MES. The generational change is examined in pooled z-score distributions for stature obtained separately for each year of age from 3 to 19 years and that for adults above that age, for each sex.

Fertility rates for five-yearly age-groups are compared between taller and shorter than average mothers. Non-randomness of homogamy for tall/short stature and for educational levels are assessed by using X^2 and normal 0,1 test in order. But in the first case, consistent results are not ignored at the exploratory stage.

RESULTS AND DISCUSSION

Secular Decline of Mean Stature : Seven successive reports on average male stature of the Mahishya population since 1916 appear to display a steady trend of gradual decline except for a small and insignificant departure in the sample no. 2 reported in 1950 (Table.1).

Table 1 : Estimates of mean adult stature in mm. of Mahishya males through time

Sample No.	Year	N	Mean	Se	Location	Source
1.	1916	16	1658.31		Bengal	Chanda, R. P.
2.	1950	51	1633.18	8.94	Diamond Harbour, 24 Parganas	Guha. B. S.
3.	1951	109	1638.61	5.37	Harpal, Hooghly	Mitra. A. K.
4.	1960	17	1634.12	15.25	Midnapur	Majumder. D. N. & Rao. C. R.
5.	1960	10	1629.00	19.88	Other districts (than Midnapur)	Do
6.	1980	204	1623.29	4.47	Amta, Howrah	Bharati. P.
7.	1981	64	1606.20	7.39	Singur, Hooghly	Mukhopadhyay. D. (unpublished)

This negative secular trend in stature is so consistent that when weighted means of samples studied within a period of one year are considered, there is almost a linear regression of average stature with time (Table 2; Figure 1). There is only a small amount of variation in the rate of decline

Table 2. Secular trend and rate of decrease in mean stature per year of the Mahishya males

Sample No.	Year	N	Mean stature (mm)	Difference (mm)	Rate per year (mm)
1	1916	18	1658.31		
2.	1950-51	160	1636.88*	-21.43	0.61
3.	1960	27	1632.22*	-4.66	0.52
4.	1980-81	268	1619.21*	-13.01	0.65

* Represents weighted mean of two samples (Refer to Table 1)

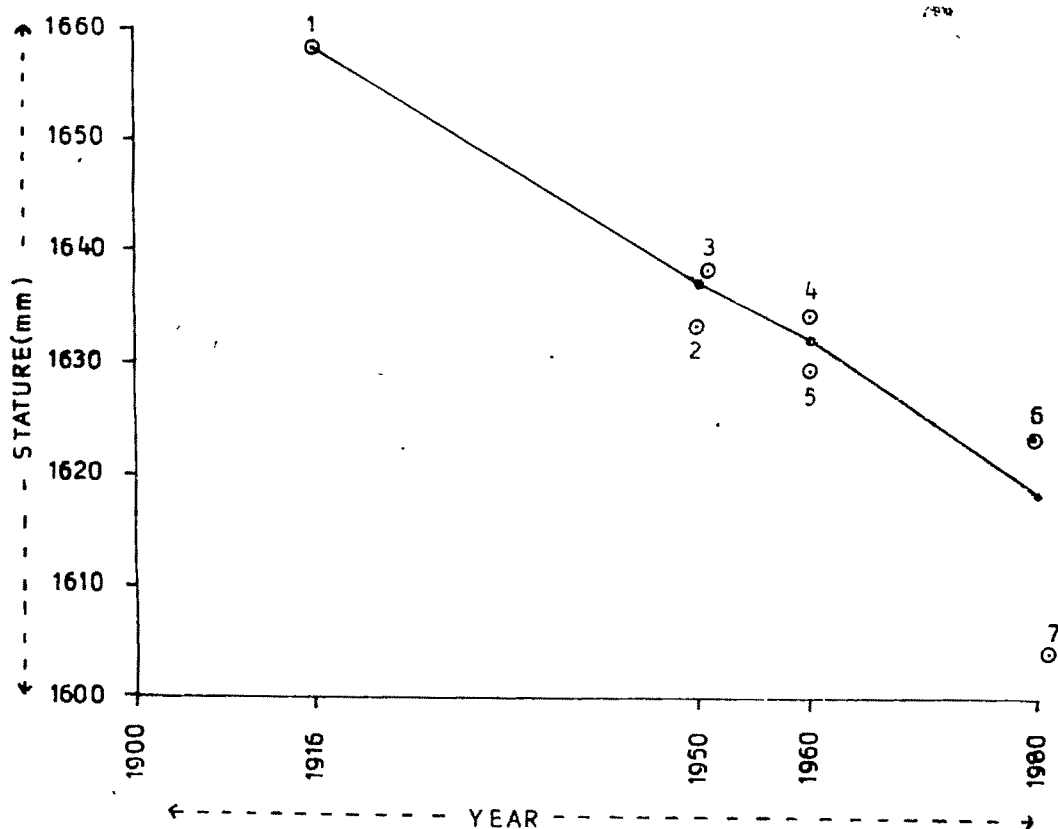


Figure 1. Cumulative decline in adult male stature of the Mahishya through time (Circles refer to different means of Table 1 and dots, weighted means of samples in a year)

per year. It is striking that this temporal trend overrides inherent problems like personal and instrumental errors, variation in the time of taking measurements, in estimation of age, sampling design and age-range of the subjects, beside sampling fluctuation. However, variation in stature due to ageing does not seem to have caused any apparent reduction in mean stature. For example, the last two samples (Nos. 6 & 7) represent individuals aged between 20 to 60 years to avoid the effect of ageing. The average stature in sample no. 7 would come down to 1603.90 mms., if seven individuals aged above 60 years with a mean stature of 1582.90 mms. were also included.

Composite Structure of the Population : As the sample studied at different points of time do not always represent the same area such as a district, we have examined the extent to which they represent the same genetic population. The quantitative data on marriage areas from the villages within the jurisdiction of Amta and Uluberia Police Stations (P. S.) of the Howrah district, of Singur P. S. of the Hooghly district and of Sonamukhi P. S. of the Bankura district suggest that, until recent times, the Mahishya has strictly adhered to the traditional rule of caste endogamy except for about 5% intercaste marriages in the Uluberia sample (Mukhopadhyay et al 1991; Mandal 1990). But each of these samples represents a local endogamous sub-population with the average marriage distance ranging from 8 Kms. in Singur to 15 Kms. in Uluberia and the mode lying between 0.5 Kms. in three sub-populations, and in that of Bankura, it is between 15 to 20 Kms (Figure 2).

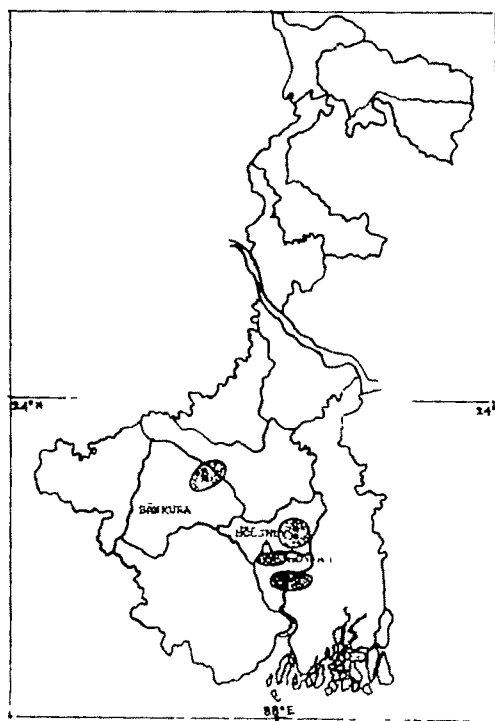


Figure 2 : Approximate marriage areas (dotted) of four sub-populations of the Mahishya population in Howrah, Hooghly, and Bankura districts (A, U, S and B refer to Amta, Uluberia, Singur and Bankura samples respectively)

Trend in Local Sub-populations : But the composite structure of the Mahishya population does not provide evidence against the hypothesis of a secular decline in stature. This is because the mean stature of the Mahishya sample from Singur is significantly ($p < 0.001$) smaller than that of neighbouring Haripal, and the centres of these two areas are only about 10 Kms. apart within the same district. There is also a fair amount of intermarriages between the Mahishya populations of these two areas. Therefore, the suggestion of a reduction in the average stature in course of three decades in the Mahishya population of Hooghly district is irresistible. It is also noteworthy that a series of sequential estimates of mean stature of the Mahishya males that have been obtained by different authors for over 65 years from different districts form an array of values with a descending order. This can be possible only if a similar process of reduction in stature is operating in local endogamous groups into which the Mahishya population is substructured.

Differences Between Local Populations : On the other hand, some amount of genetic differentiation can be expected in the composite Mahishya population inhabiting different econiches. For making a critical test of this, two pairs of samples studied within the short space of one year's time have been mutually compared, ignoring the small samples (Nos. 4 & 5) reported in 1960. While a negligible and insignificant difference of only about 0.5 cms. of the mean stature has been recorded between the Mahishya males of 24 Parganas and Hooghly districts in 1950, a significant difference ($0.02 < p < 0.05$) of mean stature is found to occur between the Mahishya males of Howrah and Hooghly during 1980-81.

The difference between the last two samples cannot be fully explained by nutritional-environmental differences, if any. The Mahishya populations of both Amta and Singur depend mainly on agriculture for their subsistence and have comparable economic status. Contrary to expectation, the adult males and females of Mahishya caste studied in Amta area more often belong to the low economic status (LES) group than those of Singur (Table 3).

Table 3 Average stature in each socioeconomic status of adult males and females belonging to Mahishya populations of Amta of Howrah district and Singur of Hooghly district studied during 1980-81.

Economic Status	HES	MES	LES	ALL (N)
Per capita expenditure	> Rs. 100	Rs. 50-99	Rs. 50 >	
MALE :				
% frequency				
AMTA	37.0	45.2	17.8	208
SINGUR	22.5	64.8	12.8	71
Mean stature in mm.				
AMTA	1640.8	1613.9	1595.5	1622.8
SINGUR	1642.7	1588.7	1609.9	1603.6
FEMALE :				
% Frequency				
AMTA	28.5	47.6	23.8	319
SINGUR	17.1	67.5	15.4	123
Mean stature in mm.				
AMTA	1488.6	1486.3	1470.2	1483.1
SINGUR	1490.8	1488.3	1468.5	1485.7

But it is the Mahishya males of Amta who have shown the relatively taller average stature during 1980-81. The males belonging to the MES group in the Singur sample are the shortest of all and not those who belong to the LES group. The mean stature of these MES men of Singur would rise only to 1589.7 mms. If the seven men aged over 60 years, who all belong to this group, are excluded.

Besides, shorter average stature of the males of the Singur sample within both high and middle income groups (HES and MES) than that of the Amta sample points to causes other than immediate effects of socioeconomic classes on the difference of stature between samples from the two districts. An important evidence against the hypothesis that 'the taller average stature of the males of the Amta sample than that of the Singur sample was caused by a better nutritional status of the former' is the taller average stature of the Mahishya females from Singur than of those from Amta, specially in the high and middle economic status. Furthermore, the sample of adult males from each of the sub-populations of Amta and Singur independently displays a continuation of the secular trend of decline in average stature, already recorded for the Mahishya population.

Stature in Two Generations: As the reduction of stature is most marked in the male sample from Singur, Hooghly, the occurrence of a generational change, if any, is directly verified in that data. It is, obviously, not possible to examine temporal change in stature in the data for males of different ages due to growth followed by reduction of stature with age. Therefore, an indirect probe into the generational change in the frequency of tall and short stature is attempted here by correcting the data for age and sex differences. This is achieved by studying the distributions of z-scores, with zero mean and one standard deviation, for stature in boys and girls of each annual age-group from 3 to 19 years, summing them up for each sex, and then comparing their pooled z-score distributions for the young (aged below 20 years) with that of adult males and females, aged above 19 years (Table 4; Figure 3).

Table 4 : Distribution and median values of z scores for stature of young (below 20 years) and adults (above 19 years) of each sex in Mahishya families of Singur, Hooghly.

Class interval	MALE				FEMALE			
	Adult		Young		Adult		Young	
	\$	%	\$	%	\$	%	\$	%
(_3.0)-(_2.6)	1	1.4	0	0.0	1	0.8	0	0.0
(_2.5)-(_2.1)	1	1.4	2	1.1	1	0.8	1	0.6
(_2.0)-(_1.6)	1	1.4	13	7.3	1	0.8	7	4.4
(_1.5)-(_1.1)	5	7.0	18	10.1	15	12.1	24	15.1
(_1.0)-(_0.6)	12	16.9	19	10.7	19	15.3	22	13.8
(_0.5)-(_0.1)	18	25.4	24	13.5	22	17.7	31	19.5
0.0 — 0.4	9	12.7	49	27.5	20	16.1	26	16.3
0.5 — 0.9	12	16.9	28	15.7	23	18.5	23	14.5
1.0 — 1.4	8	11.3	16	9.0	15	12.1	18	11.3
1.5 — 1.9	3	4.2	8	4.5	6	4.8	4	2.5
2.0 — 2.4	1	1.4	1	0.6	1	0.8	3	1.9
2.5 — 2.9	0	0.0	0	0.0	0	0.0	0	0.0
Median	_0.069		0.133		0.075		_0.089	

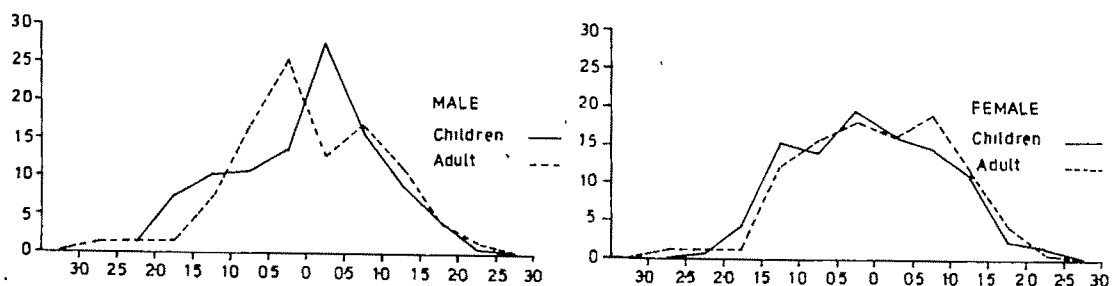


Figure 3 : Distribution of z-scores for stature among adults and children of each sex of the Mahishya population in Singur.

Each frequency polygon for z-scores of stature in the young and adults of either sex tends to show a bimodality, which for the young males i.e. boys, can be inferred from the hump in the left (negative) side of the distribution. The hump in the distribution among boys reflects an overlapping of the two modes due to a low frequency of the lower (left side) mode in them. The superimposition of the distributions for the young and adults of the male sex reveals a smaller frequency of 42.7 per cent of negative values of the z-scores, representing taller than average stature, in boys than in adult males (53.7 per cent). The boys also have a larger frequency of 27.5 percent of the just below average stature (represented by z-scores ranging from 0 to 0.5) than in the adult males (12.7 per cent).

As the data for adult males are collected from fathers in a large majority of cases, and that for boys aged below 20 years are invariably from sons of those fathers, the observation just made indicates an increased frequency of shorter heights (positive z-scores) among the boys. However, no such apparent decrease in the frequency of taller than average stature is noticed in the sample of younger females (aged below 20 years). However, the median values of the z-score distribution of adult males and females together turn out to be smaller (0.006) than in the young boys and girls together (0.044). This reflects the occurrence of a larger proportion of shorter than average height in the young than in adults among the Mahishya families of Singur. This observation of a decline in average stature in the younger generation is further strengthened by the fact that extremely tall individuals, represented by z-scores beyond -2.5 on the left side of the distribution occur only among adult males and females and not in the young boys and girls.

A Case for Selection : It is observed in the data that average numbers of both live births and surviving offspring tend to exceed in the mothers who are shorter than average in most of the age-groups of five years as well as in the total sample (Table 5). This is not due to any substantial difference in the proportion of non-literates between the two groups of mothers (Table 6). If anything, the shorter mothers display a higher proportion of education at least upto the secondary level than in the taller mothers.

Table. 5: Average number of live births and surviving offspring of Tall and Short mothers of each five yearly age group among the Mahishya of Singur, Hooghly

Mothers Age group (Years)	n	Tall		n	Short	
		Live birth m	Surviving offspring m		Live birth m	Surviving offspring m
20 — 24	9	1.00	1.00	11	1.36	1.18
20 — 29	10	3.10	3.00	6	3.00	2.67
30 — 34	13	4.23	3.77	13	5.00	4.25
35 — 39	5	4.80	4.80	15	4.93	4.29
40 — 44	4	7.75	6.00	7	7.71	6.43
45 — 49	3	6.00	4.33	1	9.00	9.00
20 — 49	44	3.79	3.36	53	4.41	3.80

Table. 6: Distribution of Tall and Short mothers with levels of education.

Education level	Tall		Short	
	n	%	n	%
Nonliterate	26	59.1	32	60.4
Primary	11	25.0	9	17.0
Secondary (at least)	7	15.9	12	22.6
All	44		53	

Effect of Reproductive Isolation: Again, the indication of bimodality in z-score distributions for stature in the data would suggest the possibility of amount of segregation of homozygotes for genes involved in the development of stature in the absence of any evidence of recent admixtures (Mukherjee 1984). This is especially relevant in the background of the characteristic of Indian populations to divide and subdivide forming hierarchies of isolation (Mukherjee 1971, 1993). There is indeed some evidence that apart from maintaining the tradition of caste endogamy often within the boundary of a part of a district, the local Mahishya populations of different places have, in several ways, tended to form incompletely isolated groups within which marriages are preferred. A few of these are observed in course of our genealogical studies among the Mahishya families in a number of places. For example, marriages within surnames and within gotras are found to occur more often than expected by chance. In one instance, the Mahishya families of Uluberia fail to display the custom of surname exogamy. Only three out of eight marriages of males of the Manna surname are contracted with women of Manna surname, and two of the ten men of the Mandal families have married with women of Mandal surname (Mandal, 1990). The number of marriages within most common gotras significantly ($p < 0.01$) exceed the randomly expected numbers of such marriages.

Again, in the Mahishya population of Singur, we have observed a significant excess of homogamous marriages for levels of formal education and literacy (Table 7).

Table. 7 . Observed and Expected frequencies of marriage between spouses of different educational levels among the Mahishya of Singur along with critical values of Normal 0,1 test of Significance.

Marriage type		Observed (O)		Expected (E)	(O—E)	Critical	P
Male X Female	n	Proportion	+ se	Proportion	Proportion	Value	
HOMOGAMOUS .							
N X N	80	0.290	0.03	0.187	0.103	2.9	<0.01
P X P	11	0.040	0.01	0.034	0.006	0.4	
S X S	65	0.235	0.02	0.122	0.113	4.0	<0.001
ALL	156	0.565	0.03	0.343	0.222	5.2	<0.001
HETEROGAMOUS .							
ALL	120	0.435	0.03	0.657	- 0.222	- 5.2	<0.001

Note: Frequencies of spouses with different educational levels

Educational level	Male		Female		Total
	n	Proportion	n	Proportion	
Nonliterate (N)	90	0.326	158	0.573	248
Primary (P)	60	0.217	44	0.159	104
Secondary (S)	126	0.457	74	0.268	200
(at least)					
All	276		276		552

As educational levels are found to aggregate in families, this trend of assortative marriage is likely to reduce the effective size of the marriage group. Besides, an excess of homogamy for short and tall stature over that expected by chance alone is also observed in the same sample, although the size of the sample is not large enough to show significance of this excess at $p=0.05$ level (Table 8).

Table 8 : Frequency Homogamous and Heterogamous marriages between Tall and Short spouses in the Mahishya population of Singur, Hooghly.

STATURE	MALE		FEMALE	
	F	%	F	%
Tall (T)	19	42.2	27	60.0
Short (S)	26	57.8	18	40.0

Marriage Type	Observed		Expected	
	F	%	F	%
HOMOGAMOUS .				
T X T	13	28.9	11.4	25.3
S X S	12	26.7	10.4	23.1
ALL	25	55.6	21.8	48.4
HETEROGAMOUS .				
T X S	14	31.1	15.6	34.7
S X T	6	13.3	7.6	16.9
ALL	20	44.4	23.2	51.6

X^2 for 1 d.f. = 0.972

It can be inferred from these findings that in spite of a strict adherence to the rules avoiding marriages between close relatives, the local Mahishya populations of different areas tend to break up into smaller demes, in which, processes like random drift and even some amount of random inbreeding can operate. Each of these processes can not only increase homozygosity for quantitative variations like stature, for which there are few recessive genes with negative effects as well (Mukherjee 1984). They would also enhance the speed of directional selection which might be otherwise operating with slow rates. It is, therefore, not unlikely that the observed trend of cumulative regression of stature through generations in the composite Mahishya population of West Bengal has directly and also indirectly resulted from the social and genetical structure of that population and changes occurring in it from time to time.

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Effects of Maternal Age, Birth Order and Rural-Urban Differences in the Rate of Twinning in Bengalees

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Abstract : Twinning rate during a five-year period (1985-1989) in a rural Bengalee population was investigated using birth record data from Midnapore Sadar Hospital, Midnapore, West Bengal. Out of 21,773 births for the years 1985-1989, 303 twins, 3 triplets and 1 pair of twins with unidentified sex were found. The overall twinning rate noted to be 13.92 per thousand where Monozygotic (MZ) and Dizygotic (DZ) twinning rates to be 8.08 and 5.88 per thousand respectively. Regression analysis performed on the effects of maternal age (MA) and birth order (BO) on twinning showed significant regression coefficients both in case of MA ($t = 5.41$, D. F. 4, $p < 0.01$) and BO ($t = 4.54$, D. F. 4, $p < 0.01$) thereby indicated that these influenced significantly the twinning rate in rural Bengalee population. Further, proportion of twins, 0.01392, in the present study of rural Bengalee population was found to be significantly higher ($z = 3.61$, $p < 0.05$) than the proportion of twins, 0.01050, in urban Bengalee population. This finding is in conformity with works done on Japanese, Finnish and Nigerian populations. The possible reasons for rural and urban differences in twinning were discussed in the context of Bengalee population.

Twin study in India was first initiated in 1934 by a famous gynaecologist Sir Kedarnath Das and Indian workers had been doing researches on twins during past six decades (Sarkar 1945, 1958, Park, Chandra and Upadhyaya 1966, Nanda and Patnaik 1968, Sarkar and Sarkar 1967, Goswami 1970, 1987, Goswami and Wagh 1975, Bhalla, Bhalla and Srivastava 1977, Guha 1977, 1982, 1983, Srivastava, Bhalla and Bhalla 1977, Ghosh, Ramanujacharyulu and Ramanujacharyulu 1979, Banerjee 1983, Sharma and Sharma 1984, Thirumalaikulundusubramanian et al. 1986, Das Chaudhuri, Biswas and Basu 1989, Talsania and Purohit 1990). Most of the research works on twin studies mentioned above were limited to mere reporting of twinning rates among different populations of various regions in India. In almost all of studies, twinning rates estimated based on populations whose ethnic origins were not clearly specified. In some studies, available sample sizes of total births considered for estimation of twinning rate were not sufficient enough. Moreover, the populations appear to be mixed ethnic origin as they belonged to city/town hospitals (Park, Chandra and Upadhyaya 1966, Goswami 1970, Srivastava, Bhalla and Bhalla 1977, Ghosh, Ramanujacharyulu and Ramanujacharyulu 1979).

Attention should be focussed on a specific population of a particular area in estimation of twinning rate. More so, in estimation of twinning rate, rural populations are to be given priority as the majority of populations are rural based. The variation in twinning frequencies in different populations of India offers a unique opportunity to investigate factors responsible for this variation. This opportunity does not prevail so much in other developing countries and not at all in developed societies of western world.

Given above, in the present study, an attempt has been made to estimate twinning rate in rural Bengalee population. In addition to that the study was designed to clarify the effect of well known factors such as maternal age (MA) and birth order (BO) on twinning rate. Finally, the problem of higher twinning rate in rural than urban population was examined in context of Bengalee population.

MATERIAL & METHODS

Data for the present study consisting of birth records for the years 1985-1989 were collected from Midnapore Sadar Hospital, Midnapore, West Bengal. Though the hospital is located in the district town Midnapore, most of the patients come from surrounding villages. The villages are inhabited by multicasite Bengalee population along with Muslims and very infrequently tribals. As the patients come from different villages, this studied sample can be designated as random sample. Although the sample from hospital is usually considered to be biased but there is no other alternative to acquire information on a large number of twin births than the hospital. The Bengalee caste population is a Bengali-speaking endogamous caste group of West Bengal and by religion faithful to Hinduism. It consists of both non-scheduled and scheduled caste groups. Ethnically, the Bengalee Hindu caste population is probably a blend of Dravidian and Mongoloid elements with a strain of Indo-Aryan blood in the higher caste groups (Risley 1892).

The total number of deliveries collected from the hospital for the years 1985-1989 was 24,411. The present study deals only with rural Bengalee population consisting of total 21,773 births out of which 303 twins, 3 triplets and 1 pair of unidentified sex were found. The Muslim and tribal populations consisted of 1540 and 1098 deliveries having 30 and 28 pairs of twins respectively. Information consisting of the following items in collection of birth records of twins were taken into consideration, name and address, age of mother, religion, parity, labour history, birth weight in grams and sex of the baby from the hospital Register. Retrospective study of twin birth was undertaken. Twin births were recorded as they occur instead of employing any selective technique. Zygoty of twins was estimated by using Weinberg's Differential Rule (Weinberg 1901). Homogeneity of the total sample with respect to woman (mother) has been included only once in the sample under study. The z-test was applied to examine the rural and urban differences in twinning. The regression analysis was performed on the effects of maternal age and birth order on twinning rate.

RESULTS & DISCUSSION

Total 21, 773 birth records on rural Bengalee population from Midnapore Sadar Hospital for the years 1985-1989 consisted of 21,466 single births and 307 multiple births out of which 303 twins, 3 triplets and 1 pair with unidentified sex found were shown in Table 1. The twin pairs with different sex combinations along with twin birth per thousand deliveries were presented in the same Table 1. The overall twinning rate was found to be 13.92 per thousand and MZ and DZ twinning were found to be 8.04 and 5.88 per thousand respectively in rural Bengalee population. Annual twinning rates by zygoty estimated using Weinberg's method were also given in Table 1. The variations in annual DZ twinning appeared to be more marked than MZ twinning when the result of the year 1985 was excluded.

The available existing literature on twinning rates in rural and urban Bengalee populations of West Bengal were compiled and presented in Table 2. The twinning rates in populations from different regions of India collected were shown in the same Table 2. Table 2 shows the twinning rates computed on all studies from urban areas of West Bengal were based on mixed

populations. In view of the fact the twinning rate 10.50 per thousand obtained (Guha 1983) from S. S. K. M. Hospital, Calcutta was considered to be as representative of urban Bengalee population since verification of addresses of mothers admitted to the hospital for deliveries reveal that 94.15% of them belong to the city of Calcutta. In examining rural and urban differences in twinning rate, the twinning rate 13.92 per thousand or proportion of twins 0.01392 of the present rural Bengalee population was found to be significantly higher ($z = 3.61$, $p < 0.05$) than the twinning rate 10.50 per thousand or proportion of twins 0.01050 in urban Bengalee population. Twinning rates of other studies in urban Bengalee populations were not comparable with the present study as these were based on mixed populations of city hospitals (Sarkar 1945, 1958). Besides West Bengal, the twinning rates reported in studies from areas of Madhya Pradesh (Goswami 1970) were high but these studies also based on inadequate sample sizes. Twinning rate 15.97 per thousand was observed (Goswami and Wagh 1975) in rural populations mainly from Madhya Pradesh, Maharashtra and Rajasthan. The study suffered from the drawback in the sense that specific populations considered in estimation of twinning rates from different rural areas of above mentioned three states were not clearly reported. The single work that contradicts to the higher twinning rate in rural areas was recently reported to be 10.1 per thousand from a study on Gujrati population (Talsania and Purohit 1990).

It is quite well known that regional fluctuation in twinning rate may be due to many factors such as ethnic fertility difference, climatic or nutritional variations, etc. The present study along with the work (Goswami and Wagh 1975) clearly revealed that twinning rate was significantly higher in rural than urban population. This is in conformity with the works (Komai and Fukuoka 1936, Eriksson and Fellman 1967) where higher twinning rates were reported in rural areas from Japanese and Finnish populations. In rural Nigeria, twinning rate found to be 45.7 per thousand which still remained highest in the world (Nylander 1969).

Although the global phenomenon of higher twinning rate in rural than urban population has been found to exist but the reason for this fundamental problem is difficult to explain. The following explanations may be put forwarded. Two major reasons have been pointed out (Goswami 1970), one, higher age of mothers and two, higher inbreeding levels in rural areas. Recently, it was found that twinning phenomenon has a direct relationship with inbreeding status of mother. In fact, higher rates of twinning were found among Muslim populations in Calcutta (Guha 1982) and surrounding areas and this can be attributed to higher inbreeding among them.

Twinning rates per thousand deliveries by maternal age and zygosity were shown in Table 3. A trend in increase in twinning rate was observed in maternal age groups from — 19 years to 40 — years with an interruption in age group of 35-39 years. When total twinning rate was decomposed into MZ and DZ, both of them do not show any clear trend of increase or decrease according to maternal age groups. The effect of maternal age on the components of MZ and DZ twinning in rural Bengalee population could not be appreciated probably because of small sample sizes in different age group of mothers (Table 3). In the present study an analytical approach has been made to examine the effect of maternal age on twinning by using linear regression analysis. The regression of maternal age on twinning is $y = -7.39 + 0.92 x$, the regression coefficient, 0.92, is statistically significant ($t = 5.41$, D. F. 4, $p < 0.01$) thereby indicates that maternal age significantly influences twinning rate in rural Bengalee population. The result

of this study is in agreement with the findings of other workers (Eriksson, Eskola and Fellman 1976, Imaizumi and Inouye 1979, Imaizumi, Asaka and Inouye 1980, Inouye and Imaizumi 1981, Mosteller 1981). In India the effect of maternal age of twinning had been investigated by a number of workers (Sarkar 1945, Park, Chandra and Upadhyaya 1966, Nanda and Patnaik 1968, Bhalla, Bhalla and Srivastava 1977, Guha 1982, Ghosh, Ramanujacharyulu and Ramanujacharyulu 1979). In general, these studies are descriptive in nature and reveal that twinning increases in mothers of age group above 30 years. It is unfortunate that in some of the above mentioned studies class intervals with respect to age group of mothers as usually followed in twin studies were not maintained. For this, comparison of results of different studies become difficult.

The twinning rates per thousand deliveries by birth order and zygosity were presented in Table 4. It is apparent from Table 4 that there is a sharp increase in twinning rate from first to second birth order; it gradually increases up to fourth, drops a little in fifth and reaches the peak at sixth. The MZ and DZ components by birth order show variable twinning rates without any clear picture. In India, higher birth order associated with twinning rates had simply reported (Park, Chandra and Upadhyaya 1966, Guha 1982, Ghosh, Ramanujacharyulu and Ramanujacharyulu 1979). As in case of maternal age and twinning, the regression of birth order on twinning is $y = 10.12 + 3.92x$, the regression coefficient, 3.92, is statistically significant ($t = 4.51$, D. F. 4, $p < 0.01$) thereby shows that the birth order significantly influences twinning rate in rural Bengalee population. The result of the present study supported the works of other authors (Inouye and Imaizumi 1981, Mosteller et al. 1981). the question remains to be solved in regard to the fact that maternal age and birth order may be linked with twinning rates. In fact, it may be mentioned that evidence of the effect of interaction term for both the factors maternal age and birth order influencing MZ and DZ rate have been indicated using quadratic regression model in an analysis of twinning rates in Japan (Inouye and Imaizumi 1981). Our data in the present study do not permit to use this model as sample size of twins in respective age groups is not sufficient.

Finally, it may be concluded that reliable and dependable data on large twin birth statistics from rural and urban origin of a particular population together with advanced method of analysis should be taken into consideration to throw more light on the problems attempted in the present work.

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Table 1. *Twinning Rates per Thousand According to year, Sex Combinations and Zygosity*

Year	Total number of Deliveries	Total number of twin deliveries	Total number of Triplets	Unidentified Sex pairs	Both Male twins (M/M)	Both female twins (F/F)	Either sex twins (M/F)	MZ		DZ		Twinning rate per thousand
								Number	Rate per thousand	Number	Rate per thousand	
1985	3802	56	—	—	22	28	6	44	11.57	12	3.16	14.73
1986	4524	70	—	—	37	15	18	34	7.51	36	7.96	15.47
1987	4347	53	—	1	23	18	11	31	7.13	22	5.06	12.19
1988	4427	57	2	—	20	27	10	37	8.36	20	4.52	12.87
1989	4673	67	Both M/M/M 1 F/F/F	—	26	22	19	29	6.21	38	8.13	14.33
Total	21773	303	3	1	128	110	64	175	8.04	128	5.88	13.92

Table 2 *Twinning Rates : West Bengal (Urban and Rural) and India (Rural).*

Population	Total Number of deliveries	Total Number of twin births	Twinning rate per thousand			Author and year
			Total	MZ	DZ	
Mixed population	101044	1335	13.21	—	—	Sarkar (1945)
Mixed population	82010	871	10.62	—	—	Sarkar (1958)
Hindu population (S. S. K. M. Hospital)	29734	315	10.59	2.79	7.80	Guha (1983)
Mixed population	171488	1893	10.91	3.72	7.91	Banerjee (1983)
Mixed population	32873	334	10.16	4.41	5.23	Das Chaudhuri et al. (1989)
Hindu population	21773	303	13.92	8.04	5.88	Present study
Not mentioned	16541	167	10.09	4.53	5.56	Talsania and Purohit (1990)
Not mentioned	161613	2570	15.90	—	—	Goswami and Wagh (1975)

Table 3 *Twinning Rates per Thousand Deliveries by Maternal Age and Zygosity.*

Maternal age	Total births		Total twin births		MZ		DZ	
	Number	% of total	Number	Rate per thousand	Number	Rate per thousand	Number	Rate per thousand
—19	4557	21.19	47	10.31	29	6.36	18	3.95
20—24	9130	42.47	109	11.94	61	6.68	48	5.26
25—29	5088	23.67	82	16.13	56	11.07	26	5.11
30—34	2083	9.69	49	23.52	17	8.16	32	15.36
35—39	553	2.57	12	21.70	8	14.47	4	7.23
40+	86	0.40	3	34.88	—	—	—	—
	21497 ^a	100.00	302 ^b		171	7.95	128	5.95

a) Omission of number of births is due to nonavailability of age of mothers

b) 1 pair of twins whose maternal age was found to be not recorded in labour register of the hospital

Table 4. *Twinning Rates per Thousand Deliveries by Birth Order and Zygosity.*

Birth order	Total births		Total twin births			MZ		DZ	
	Number	% of total	Number	% of total	Rate per thousand	Number	Rate per thousand	Number	Rate per thousand
1	10409	53.23	102	34.00	9.79	64	6.15	38	3.65
2	4554	23.29	93	31.00	20.42	43	9.44	50	10.98
3	2640	13.50	56	18.66	21.21	38	14.39	18	6.82
4	1217	6.22	30	10.00	24.65	26	21.36	4	3.28
5	489	2.39	11	3.66	23.45	1	2.13	10	21.32
6 +	264	1.35	8	2.66	30.30	2	7.58	6	22.73
	19553 ^a		300 ^b			174	8.89	126	6.34

a) Omission of number of births is due to nonavailability of parity of mothers

b) 3 pairs of twins whose parity was found to be not recorded in labour register of the hospital

Hierarchical Classification of Environment : The Cases of Plant Domain of the Juango and Land Domain of the Santal

SYAMAL KANTI SENGUPTA

DEBASHIS GHOSH

Abstract - This study is an exploratory research on ethnoscience and is shaped to understand how the members of different cultures professing different economic activities perceive their environment and how they utilise these perceptions for their livelihood. Two distinct domains - plant and land were selected to unravel the knowledge on hierarchical classification of environment by the two tribes - the Juango and the Santal. The authors tried to understand the environment of these communities which are termed as 'perceptual' and 'effective' environment. The reduction of environmental domains into two of its kind was aimed at because of the intense interest of the Juango on plant and that of land by the Santal. Attention was given to some specific aspects of folk taxonomies. The significance of ARO (bamboo) in the Juango economy was expressed through the differentiation of ARO.

The understanding of community cognition of environmental domains is explained through 'naming' as one of the chief methods for imposing order on perception. Interestingly it is seen that the Juango and the Santal seldom can go in conceptualising their environment beyond the domain of 'effective' environment. Classification of the environmental domains of plant (*Samusin*) and land (*Baid*) was done on the basis of morphological features and use-pattern of the domains. The right to the *Atu Baid* (village land) is a community right explained in classifying the use pattern of different items by the Santal. The authors deal with the Juango *Samusin* and the Santal *Baid* as two different environmental resources to arrive at the hierarchical arrangement of these resources by the communities in question. The study used the current crafts of ethnoecology - taxonomy, paradigm and key.

ARGUMENT

This paper emphasised on the study of environment as conceived by the people under study without imposing any apriori structure or concept on them, to unravel the indigenous concepts and to know the true relationship between the people and their environment. Bates (1960) has defined "environment" in three ways : firstly as the element perceived by the organism; secondly, as the element perceived or not that affect organism; and lastly as all elements which influence or not but are detectable or inferrable. For the purpose of the work the authors culled facts on perceptual and effective environment. The idea of this research is to provide a better understanding of how people perceive their environment and how they organise these perception. The authors sincerely believe that this approach operationalises to the obvious fact that what people think about their environment and how they categorise that information which necessarily affect what they do to their environment (Morgan 1979), what Rappaport (1968) calls the cognised environment, the environment that is actually perceived by a human group (Anderson 1973). Both the perceptual and the effective environment of any human group are relevant to the understanding of its behaviour and ecology (Bates 1953).

In recent years many ethnographers have intended to describe the environment as the people themselves construe it according to the categories of their ethnoscience (Frake 1962 : 55) in a hope to determine the extent to which ecological considerations in contrast, enter into a person's decision of what to do. For this purpose cultural behavior is studied and categorised

in terms of the insider's view — the actors definition of human events. This emic approach has become the culture-specific aspects of peoples world and also become essentially the same as an ethnoscientific one.

THE UNIT OF STUDY

The unit of study for the present discourse is the **Juango** inhabited in **Kantala** and **Samala** villages of Dhenkanal district in the state of Orissa; and also the **Santal** of **Kadamdihi** village of Singhbhum district in the state of Bihar. The Juango mainly profess basketry for their livelihood; the raw material of basketry is *Aro* (bamboo) which the Juango procure from the foot hill forest of Malyagiri hill. On the other hand the Santal live on agriculture on various types of *Baid* (land).

The word Juang or Juango refers to the name of the tribe as well as to their language. The tribe is also referred to as *Patua* because the women folk of the tribe formerly used to wear leaf dress (Grierson 1906, Elwin 1948). Keonjhar is the *Matiprithwi* of the Juang where they originated (Elwin 1948). Bose (1929) found two sections of the Juang : the *Thaniya* those who dwell in their original home and *Bhagudiya* those who left their original home. The *Thaniya* live in the Keonjhar table land and others are *Bhagudiya*.

The villages : Kantala and Samala resemble each other on one important feature that they show sahi organisation (hamlet organisation). The Juango sahi is located towards the periphery of the village at a considerable distance away from other sahis : Sahara and Chasa communities. There are number of taboos prohibiting the interaction of the Juango and the others : Sahara and the Chasa. The Juango of Kantala have total population of 112 individuals with sex ratio of 104 females per 100 males. The Juango of Samala have a total population of 57 individuals with a sex ratio of 114 females per 100 males. The Juango of Kantala and Samala are totally illiterate.

The village Kadamdihi (area 117.30 hectares) is situated in the vicinity of Ghatsila and Moubhandar town and inhabited by the caste as well as the tribal people. These two groups live in two separate settlements forming two distinct hamlets — the Kumharpara and the Adibasipara. The Kumharpara consists of pottery making caste population the Bhakat, living in the eastern part of the village. The Adibasipara comprises mainly of the Santal, living in the south western part of the village. All the Santal introduce themselves as Adivasi and usually refer their names to outsiders adding Majhi after their first name. The Santal population of Kadamdihi is 309 of which 165 are males and 144 females, having average family size of 5.5 persons. Only 7.5 per cent of the Santal are literate.

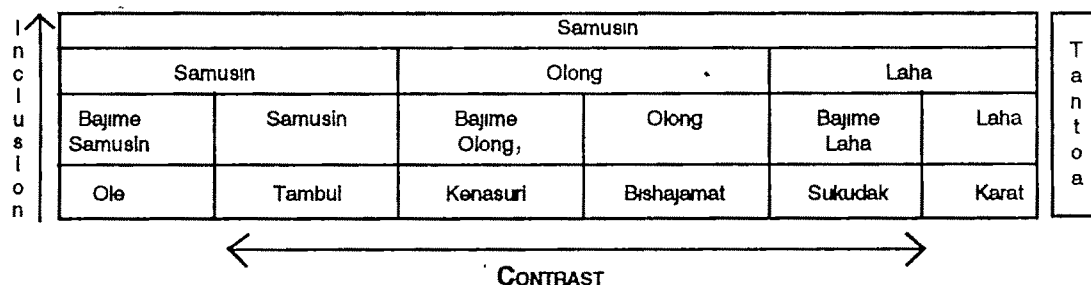
SOCIALIZATION OF NATURE : THE JUANGO CASE

The distinct knowledge of the Juango about one domain of the environment for example plant and in case of the Santal land have been considered in this discourse for the reasons of implicit dependence of the Juango on the plant resource and that of the Santal on land. Thus these two

domains pose crucial questions to the authors as they indicate differential interests on livelihood activities. Such a knowledge on plant and land reveal the different items that have been included within these domains and the relationship that one item bears with another within the domain.

The authors claim to show how the social practice of nature hinges at one and the same time on the idea, a society has of itself, the idea it has of its material environment and the idea it has, of its intervention in that environment (Descola 1994). The task was facilitated by the fact that the Juango and the Santal go about their socialization of nature in a 'domestic setting'. Each household (Orah) of the Juango or the Santal thinks of itself as an independent centre where the relation to nature is constantly socialized. The authors tried to keep aside the theme of abstract knowledge of environment on the ground that they analysed the plant and land domains of concrete classification and experiencing of nature in their material and conceptual forms. They have taken the ecology of the tribes in question in a very broader sense to designate the study of the relations obtaining between the communities under study and their environment. But it is important to note that the relations a society entertains with its environment are not univocal and cannot be conceived univocally in terms of adaptive responses, but contribution to an ecological approach in the broad sense in showing creativity, each culture brings to its manner of socializing nature (Descola 1994).

Fig 1. : *Juango Folk Taxonomy of plant*



The term *Samusin* constitutes one semantic domain in Juango culture. This semantic domain consists of a class of objects which share one feature in common, they grow on the land—which differentiate them from other semantic domains. Thus, although they include the plants, which grow in water within the semantic domain 'plant', in Juango culture these constitute a separate semantic domain—*Tantoa*. There are some other salient attributes of the domain *Samusin*, for instance they show the presence of *Ceroro* (root), *Dahi* (stem), and *Olak* (leaf).

The data reveals that in Juango culture the folk taxonomy of plant is a three stage classification. The attributes used in these stages are not same. In the first stage of classification there is emphasis on the presence or absence of certain features regarding the morphological features and the structure of the plant. In the second stage the sole emphasis of the classification lies on the use value of the plants and in the third stage, the emphasis is again on the morphological features regarding the structure of the plant.

ATTRIBUTES OF THE FIRST STAGE OF CLASSIFICATION

Samusin : These plants can grow to a greater height above the ground than the Olong and Laha. The strength or the woodiness of these plants is greater than the other two. They show the usual parts of an ideal plant viz., *ceroro* (root), *dahi* (stem), *daro* (branch), *chakolakdo* (bark), *olak* (leaf), *rasin* (flower), and *lahuro* (fruit). There are exceptional cases too.

Laha : These plants either grow along the surface of the land or grow above the land surrounding other trees. The strength or woodiness of these plants is in between the other two categories. The distinctive feature of this category is the presence of *ithir* (tendrils).

Olong : These plants grow above the land but are characterised by somewhat stunted growth. They are *dorido* (short) in height and weakest of the three categories.

ATTRIBUTES IN THE SECOND STAGE OF CLASSIFICATION

In the second stage of classification the emphasis is shifted from the morphological features of the structure of the plant to the use value of the plant. Thus each of the categories of plants are divided into two divisions. In one division is included all those plants, any or all parts of which can be considered as food by the Juango. The prefix *bajime* is added to denote this division. Within the other divisions are kept those plants which have no food value from the Juango point of view. This division is denoted by relating the name of the first stage of classification and sometimes by adding a prefix *bisha*.

ATTRIBUTES USED IN THIRD STAGE

In the third stage of classification different plants of each of the groups of plants categorised in the second stage of classification are further differentiated on the basis of relative size, shape and colour of leaves, flower and fruit in order to enable the members of Juango culture to recognise the Juango specific plants. Following Berlin, Breedlove and Raven (1966) Juango specific group has been conceived as any taxon which includes no other taxa. The drawback at this stage of classification is the fact that some of these plants are further classified. But for certain reason of the researcher here "Juango specific" term has been used. The researcher further has taken the chance of classifying some of the culturally significant varieties of plants.

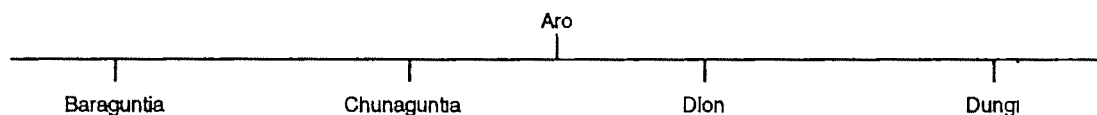
The Juango *Samusin* refers both to a "specific category of tree" and "tree" in general. Thus a hierarchical model which shows the relationship of domination ("A dominates B = "B is an A") may not account adequately for the Juango taxonomies. The important feature is to use one important attribute to define the domain of plant. This attribute makes the relationship between land and plant inextricable in Juango culture. Thus they keep *tantoa* (aquatic plants) outside this domain. In the first stage of classification the emphasis is on the morphological features. Differences in the use of attributes become most prominent in the second stage of classification. At this stage the Juango use only one attribute - the food value of the plant - to classify all the different categories of plants of the first stage of classification, into two sub categories of each. The sub-category which includes edible plants is denoted by adding the word *bajime* to the

already existing category name. Similarly, the sub-category which includes non-edible plants is denoted by adding the word *bisha* to the already existing category name. Thus socialization of plant domain starts at household (orah) level.

CULTURE SPECIFIC ITEMS

In perceiving the folk concept of environment on the plant domain other particular types of plants need emphasis : the plant which is directly connected with economy such as bamboo has been discussed. Any member of the Juango culture can easily classify *Aro* (bamboo) into four different types. This classification is based on morphological characters.

Fig 2 . Classification of bamboo



The Juango use *Aro* for different purposes. They recognise four types of *Aro* : *baraguntia*, *chunaguntia*, *dion*, and *dungi*.

Baraguntia and *dungi* are used for making the house roof and fencing respectively whereas *chunaguntia*, *dion*, and *dungi* are used for different types of strips required for making basket. In addition to strips required for making baskets, *Aro* is also used by the Juango to make a triangular structure called *gida* which is used as a support for scraping and polishing the bamboo strips. Except *baraguntia* any variety can be used for this purpose.

Fig 3 Use of different types of bamboo among the Juango

Baraguntia	Chunaguntia	Dion	Dungi
For making structure of the roof	For making <i>Katri</i> type of strips used in basket weaving	For making strips used in basket for tying	For making the fencing and for <i>braiara</i> & <i>cherai</i> types of strips used for making the frame and lateral support of the basket respectively

The association of different types of strips with different types of *Aro* was said to be due to relative strength of different types of strips prepared out of different types of *Aro*. In order of increasing strength, strips can be arranged as follows : *Katri*, *Bandhana*, *Cherai*, and *Braiara*. The Juango differentiate among the four varieties on the basis of relative height.

The use of *Aro* for the purpose of making baskets of different types (viz. *boonjha*, *daluri*, *Kula*, *tali*, *chalini*) is not an isolated phenomenon for some individuals of Juango culture it is intricately woven with Juango life.

The Juango determine the suitability of Aro on the basis of certain other factors :

- (1) Winter Aro is better than summer Aro because in the later case the Aro becomes more fragile;
- (2) Inter nodal distance of Aro is an important thing for preparing strips (preferably distance should be one foot).
- (3) With age the Aro becomes harder (as a result Aro of age within three years are preferred for basketry).

Thus it is clear from the *ut supra* discussion that the Juango folk taxonomy of *Samusin* (plant) shows extensive emphasis on classifying all kinds of *Samusin* on the basis of the attributes whether the Juango specific plant provides any food to the Juango or not. Such folk taxonomy acts as a means through process of socialisation and introduces its members about the Juango specific *Samusin* which provides food and economic activities enabling them to thrive in the world depending on the forest plants to a great extent.

Thus *Samusin* bears the patterns of resource utilisation. The Juango classify the Aro with distinct functions, which indicates over-differentiation of Aro in Juango folk taxonomy. The classification of *Samusin* and Aro indicates the idea on their "perceptual environment" and determines the way they utilise their environment to get along the world.

SOCIALIZATION OF NATURE : THE SANTAL CASE

The authors tried to investigate the perception of the Santals towards the natural environment. On asking what are the different kinds around them, they replied *Daare*, *Dhiri*, *Dah*. Then what does this mean, they answered *Daare* means trees, *Dhiri* means stones and *Dah* is water. What is the other kind ? This is *Janwar* that includes all the animals. What is the next kind? The *Horko* i.e. people. Thus the entire earth was termed by them as *Pithimi*. The category *Daare* includes all the plants of land and water. *Dhiri* encompasses all the lands (*Baid*), hills (*Budu*). *Dah* means all types of water from well (*Kuan*) to river (*Ganda*). The things who have life (*Jibit menaya*) called by them as *Janwar*.

The study of perceptual and effective environment helps us to know what phenomena they see in which they response and also to understand what they believe regarding the relations among these phenomena and what the people perceive as possible course of action for dealing with them. The Santal conceptualized the things in the *Prithimi* (the Earth) could be divided and named into *Daare* (plant), *Dhiri* (stones) and *Dah* (water), *Nehorko* (people), *Janwar* (animals). They could differentiate the above categories into two things - having life (*Jibit menaya*) and the other things with no life (*Jih nahay*). Then using continuous and exhaustive question frame on these, the taxonomy of the Santal natural categories (Fig. 4) is unveiled

Out of the taxonomy of the Santal natural environment the authors have emphasized on land, as pointed out earlier, the major resource for their livelihood and classified the domain to discover the underlying order based on morphological and behavioural data. In describing the land, the agricultural land (*Baid*) and habitable land (*Basuf*) is differentiated by people in terms of contrasting features high (*chetan*) and low (*latar or namo*). These lands of different levels are

further distinguished by another contrasting feature, that is fertility. The land types that are terminologically distinguished include four types of cultivable lands (*Danga, Gora, Ghutu, Bohal*) and three types of ecological field zones (*Gulppidi, Patit* or *Khil khunt* and *Gadrapada*). The fertility of the land is dependent on soil condition, water retaintivity and amount of crop yielded per bigha (0.42 decimal in Singbhum area).

Thus based on eliciting procedure a paradigm of land types can be made according to their views with dimensions - level (high versus low) and fertility (fertile versus infertile). This is shown in figure 5. The fertile high lands include the *gora* and *danga* and low fertile lands are the *bohal* and *ghutu*. On the other hand high infertile lands are the fallow land (*Patit khunt*) and hillock (*Gulpidi*) areas, while the low infertile lands are confined to river banks (*Gandrapada*).

The *gulpidi* (hillock) is the land of highest level and the *gandrapada* (river bank) is the land of lowermost level both are completely infertile with stones and sand and should not be used for crop cultivation. The *patit khunt* (fallow land) is also infertile and non-cultivable. The other four types of lands : *danga, gora, ghutu, bohal* - are cultivable indicating gradual lower level of land respectively.

The *danga* land is high but fertile land, soil (*hasa*) type is sandy mixed up with stone chips, kankar and other materials, reddish in colour, with weakest water retaintivity, used for kitchen garden (*budgay*) and homestead (*basuñ*) lands. The next level of land is *gora* land, reddish yellow in colour, soil mixed up with sand and water retaintivity is less. It slopes down to *ghutu* land, soil is sandy alluvial, relatively fine, , slightly reddish yellow in colour and its water retaintivity is higher and also productivity is better than *gora* land. The lands located in the lower most level are called *bohal*. The soil is blackish in colour, alluvial with loam and slightly sticky in nature. It retains much more rain water and is highly fertile than other types. This land is suitable for production of highly water resistant finer quality paddy variety.

Each of the land types described above are constituted by *hasa* (soil). They could distinguish various types of soils using single contrasting feature colour which can be arranged in a tree diagram (Fig. 6). Each of these types of soil has its specific use which is distinguished by their cultural values (Fig 8). These types of soils are found to occur in different land types already described and for their use they collect it from wherever it is found depending on its specific texture, which they can't express clearly.

It has already been shown that the level of perception of this Santal community is very limited - confined primarily to their effective environment. This perception principally depends on the level of technological development and experience which is reflected from its mode of use. In using these lands which was confined to the total area of village, their consideration was quite different. The land categories described earlier were occupied by different things as huts, garden, ponds, sacred place, cultivable lands, etc. with which the members of the community are in regular contact in terms of use. So, investigating through systematic question frames it

was found that their first consideration was in terms of ownership of land such as *Atu Baid* (village land) in which every villager has the same right to use and the other is *Apan Baid* (own inherited land) that means the land of personal use. Based on this semantic feature it was found that different categories of things and their uses were restricted to different purposes (Fig 9).

CULTURE SPECIFIC USE PATTERN

Further, various of these purposes are combined with various traits such as levelled, tilled, deserted or wooded and otherwise managed maximally. So using these four dimensions as semantic criteria, use of the land surface types could be illustrated as follows.

Fig 7 :Use of land surface categories of village

Land Uses	Land Types	Traits
<i>Basut</i> (Homestead)	<i>Danga, Patit</i>	L <u>I</u> M
<i>Budgay</i> (Garden)	<i>Danga</i>	L T M <u>W</u>
<i>Baid</i> (Cultivable land)	<i>Danga, Gora, Ghutu,</i> <i>Bohal</i>	<u>L</u> T M
<i>Bagal</i> (Grazing field)	<i>Patit</i>	<u>L</u> <u>I</u> <u>M</u> W
<i>Kuli</i> (Road)	<i>Danga, Patit</i>	<u>L</u> <u>I</u> M
<i>Dahar</i> (Bye lane)	<i>Danga, Gora</i>	<u>L</u> <u>I</u> M
<i>Jaher</i> (Sacred Grove)	<i>Danga</i>	L <u>I</u> M W
<i>Dobatti</i> (Open Space)	<i>Danga</i>	L <u>I</u>
<i>Shason</i> (Cremation Ground)	<i>Gandrapada</i>	<u>L</u> M
<i>Ahare</i> (Pond), <i>Budi</i> (Tubewell)	<i>Danga</i>	<u>L</u> <u>I</u> M
<i>Kuan</i> (Well)	<i>Gora</i>	L <u>I</u> M

L = Levelled, T = Tilled, W = Wooded/Deserted, M = Managed Maximally, L, I, W, M = Trait Absent.

These categories represent their perception about the use and management of land. Cultivable lands are completely separated from the habitational site. All the homesteads and public places are located on high lands i.e. the infertile lands with weakest waterholding capacity. With the increase of population pressure new homesteads are built up in the fallow lands, not towards cultivable lands. Jaher is located near the paddy fields at the outskirts of the village but on the high land. Only exception is the kuan (well) which is located in the paddy fields in the lower level far from the habitable land, so that it does not become polluted.

The homestead land is used mainly as dwelling site comprising of *Orah* (hut), *Racha* (courtyard), *Bakhul* (compound). Most of the households comprises more than one huts of different types named in different ways according to their purposes of use - such as living apartment of household members (*Geetiorah*), Kitchen (*Dakaorah*), Cowshed (*Dangriorah*),

Pigpen (*Sukri orah*), Fowlpen (*Simkucha*) which are found within the living compound. These huts are of different sizes and the ground plan of the huts is rectangular in form. The importance of rectangular ground plan of huts is discernible from the utilization of internal space of the apartment. Thus they allocated the limited space of the compound for human and nonhuman species and restricted their homestead lands upto a certain area in high infertile lands keeping the lands of lower level for cultivation of crops which support the mainstay of their livelihood.

In every household in the centre, courtyard (*racha*) is found which is used for various purposes such as threshing, drying of grains, cutting of wood, roaming of hens and chicken and also resting place. A corner of *racha* is used as washing corner (*Daari*) and the *tulsipinda* is centrally placed in the *racha*. The interspace between two huts is used as *budgay* which is fenced with small branches of trees (*Dor*) known as *Jhanti*. This fencing separates the area from the *kuli* and also from *racha*. A portion of this garden is used for cultivating cash crops like millet (*Joner*), maize (*Makai*). This portion is well tilled and other portion is used to produce green vegetables of various kinds, which are consumed by themselves and a portion is also sold in the market. Other portions of *budgay* are left deserted and untilled which usually are occupied by weeds and big trees and grasses.

The use of *hasa* (soil) could be delineated from the maintenance, preparation of huts and use of different material for household purposes. The perception of soil types already described was directly related to specific use which has some culturally significant values. For building huts *danga hasa* mixed with stones and *murum* is used. The huts are plastered with *jerehasa*. After plastering, the hut walls are coloured with different colours made from different types of soil. There were conventional rules and measurements for colouring the walls. The plinth of the huts are coloured with black (*Hendehasa*). Above the plinth first one and half *muka* (measurement by hand about 24 inches) portion is painted with red (*Ara hasa*), above it one *muka* portion with yellow (*Jhinga hasa*) and rest portion of the wall was painted with white (*Pund hasa*) colours in horizontal parallel stripes. The people collect these different types of soil in little quantity according to the need because these soils were not always available everywhere. There was no ownership barrier in collecting these soils from the lands.

CROP AND LAND USE

The Santal describe corresponding rules for which crops should be planted in which kind of lands. These could be fitted into the cognitive paradigm of land types and has been shown with the help of a paradigm in figure - 10. There was high agreement between the field classification and actual cultivating practices and informants' statements about the field requirement of the plants. The most commonly preferred crops are paddy (*Huru*), millet (*Joner*), maize (*Makai*) etc. The word 'No crop' means that the weakest lands, hillocks and riverbanks should not be cultivated. They are not suitable for cultivation.

The paddy variety which they cultivate in different levels by their conventional rules are of different water resistant varieties related to these types of lands. The crops like *Baramalto*, *Sitasal*, *Motichur*, *Bhojna* are paddy of finer quality and highly water resistant. So these varieties are grown only in *bohalla* land. In *ghotu* land the paddy varieties are *Majhi* and *Malto* also of finer quality and less water resistant and productivity is much better than other types. *Gorahuru* or the

paddy cultivated in *gora* land is less water resistant than *Majhi* and *Malto* but productivity of *Majhi* is little higher than the *Malto* variety. Thus we find these varieties appear repeatedly in their cultivation. Moreover they are not too much willing to choose a new variety, rejecting the old one where the water supply is uncertain, although the productivity rate might be high.

In an attempt to define and classify the Santal cognized environment it was found that their perception on land was distinguished by two components-level (High/low) and fertility, classified into seven categories. Soil was differentiated by the colour and texture. Those classification of land manifests peoples' limited perception about the environment.

LOGIC IN ANALYSIS

Classificatory systems reflected in native terminologies hold important clues to understand the mental processes by which cultural knowledge is coded and recalled (Conklin 1962). The analysis of native classification schemes helps the investigators to extract the rules by which the people decide on the category membership of objects in their experience (Frake 1962 :55). These rules determine the killing of games, the clearing of fields, the building of houses, the changing of residence etc. (Frake 1962 : 55).

The analysis of the related terms were made, mostly by means of taxonomies. The taxonomies in some cases lack linguistic labels. Fowler (1977) pointed out that the recognition that taxonomic relationships may be covert and may lack linguistic labels. It is an important methodological and theoretical point in the study of taxonomy generally. Paradigms were used in some cases to specify the terms having intersection of features. Keys were made to determine the identity of a term by means of hierarchically arranged attributes in a net work. Lexemes may be words, complexes, phrases or other units of speech that serve to label seggregates or any terminologically distinguished grouping of objects (Conklin 1962 : 120-121) and the authors took lexemes for analysis of native classification.

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Potters' Technology and Tribals in Eastern India

RANJANA RAY

MITA DAS

Abstract : Eastern India, mainly from its plateau regions, has yielded a large number of prehistoric sites rich in potsherds. Pottery tradition goes back to Neolithic stage and continues even at present. The area is also homeland for tribal people. They use earthen pots in their daily life but do not have the technology of manufacturing pottery. There exists a kind of symbiotic relationship between the potters and the tribals in the area. The authors had made a study of two villages near the trijunction area of Bengal, Bihar and Orissa for proper understanding of potter's technology in the tribal culture.

Pottery has got a long history of existence in eastern India. It started with the neolithic stage (Das *et al*, 1981, 1982; Ghosh *et al*, 1984, Ray *et al*, 1991). Earthen pots are still important aspects of material culture in this region. Eastern plateau had been a homeland for tribal people for a long time. An attempt is made to find out the place of pots and the technology in the tribal culture of the region. Major focus is laid on the trijunction area of Bihar, Orissa and West Bengal. Reason for such selection is that the area constitutes a single, geographical unit and several tribal groups live in the area. Moreover, the area is rich in prehistoric sites.

Out of the tribal communities Santals are culled. Reason for selection of the same are manifold. Pottery is an important item in the life of the Santals at present. Most of the household utensils consists of earthen pots. Pottery is not only used in the kitchen but in animal husbandry, agricultural pursuits, household brewery and even roofing of the houses.

Although pottery occupies a major part in the material culture of Santals, like most of the tribal folk in eastern India, they do not have the knowledge and technology for manufacturing them. Pottery is a traditional and caste based occupation of a specific hindu community. Santals have to depend upon the potter's community for their supply of pots. There exists a symbiotic relationship between the two communities. The potters are the suppliers and the Santals are the consumers. Study shows that potter's villages are located specifically at strategic places in relation to easy accessibility to tribal villages. Even folk tales among the potters of eastern India suggest that a potter's village is established with criteria like nearness to the forest, source of clay, sand and vicinity of tribal settlement.

Eastern India has yielded a large number of Neolithic sites. The sites have revealed in addition to stone artefacts, a large number of potsherds. Beginning of pottery in this area conjoins with Neolithic stage. Evolution of pottery from early to late, crude to fine, hand made to wheel made is established in this region. Tribals on the other hand are considered as an indigenous community in the region.

AREA UNDER STUDY

Large number of villages are studied by the authors. Out of these Kodapura is selected for the present study. This is a homogeneous Santal village situated on the side of a motorable road

from Belpahari. The village is on an elevated land and the configuration is uneven, not flat. Ridges in the form of hills are found around the village. Nearest potters' village to Kodapura is Kendapara. This is situated about 2.5 miles south of Kodapura. A low ridge lies between the two villages. Kendapara is located on a lower elevation to Kodapura. Although the area is highly deforested till both the villages have some remnants of earlier forest nearby. Both the villages are very near to the trijunction of Bihar, Orissa and West Bengal. The boundary lies about four miles south of Kodapura.

Both the villages are situated in the plateau and plains fringe area of West Bengal, an extension of Chotanagpur plateau. The area is rich in lateritic soil. Land is undulated, dotted with hills and elevated lands. Tarapheni is the master stream of the area. At one time the land was mostly covered by thick forest. Patches of jungle still could be seen in the area. The region is broadly under tropical monsoonal climatic zone.

ABOUT THE TRIBE

Santal is a major tribe in the list of 'scheduled castes and scheduled tribes' in India. Though in latter time the Santals migrated farther east into greater Assam and Bangladesh, Chotanagpur plateau region is considered as the home land of Santals (Mukherjee, 1960). Majority of population are with dark brown complexion, dolicocephalic, mesorrhini and short to medium in stature. Forehead is straight and broad, lips medium to thick. Hair is wavy. In blood group B is dominant, followed by O and A. AB is minimum (Sarkar, 1954).

Environment plays a major role in determining the economic pursuit of Santals. At present Agriculture is main economic activity of the Santals. Together with this animal husbandry plays an important role. They raise cattle, sheep, goat pig and fowl. Hunting, gathering, fishing and fowling are subsidiary economic activities. Alcoholic drink is part and parcel of the culture. Most of the people who can afford prepare alcoholic drink specially on festive occasion. Beer is prepared from rice and alcohol is distilled from Mohua flower.

Hunting-gathering is a remnant of earlier economic pursuit. This is revealed from the social and ritual hunting. Small boys roam the jungle with bows and arrows. Santals cultivate their land for crop but they do not plant fruit trees. These are collected from the forest. In addition to fruits, roots tubers are also collected. Honey and some insects are part of the food item collected from the forest. Forest product provides not only food but medicine and personal adornment also. There is a close bond between Santal and the forest. They fish in the tanks, streams, rivers and collect shell fish for consumption. Hunting-gathering is predominant in the village which are located in remote areas, where some kind of barrier prevents culture contact.

Craft has a very insignificant role in the culture of modern Santals. They make simple furniture, doors, windows, agricultural implements, dance and musical instruments from wood. Women folk make cups, mats, broomsticks out of different types of leaves (Hansda, 1980)

It may be said that in most way Santal economy is self sufficient. Dependence perhaps started as a product of acculturation (Chowdhury, 1972). In this case slight dependency is found on the potters.

POTTERY IN USE

Following pots are found in the household of Santals of Kodapura village:

- (a) *Hanra* : a big pitcher like pot with slightly wide mouth. This is used mainly for soaking paddy and sometimes for storing water. This has a durability of one year.
- (b) *Hanri* : a pot for cooking rice. A slightly bigger one is used for boiling paddy. It has a shorter duration ranging from 1 to 2 months.
- (c) *Kalsi* : This is a pitcher used for fetching and storing water. This type varies in size, usually has durability of one year or more. Tribals use Kalsi for pigeons. Pitchers are hung from the roof. Pigeons nestle in them.
- (d) *Khampir* : It is a wide mouthed pot used for cooking curry and boiling milk. Durability of this type is one year or a little more. Sometimes a hole is made and used for distillation of Mohua.
- (e) *Taoa* : This is a bowl like pot used for frying puffed rice (murhi) and rice cakes. Durability is one year.
- (f) *Mechla* : This is a larger bowl like pot and is used for boiling cloth and carrying them to the pond for washing. Durability is a year.
- (g) *Kuri* : This is quite large and deep bowl shaped pot. In fact it is a manger. Fodder for cattle is served in it. Durability is one year.
- (h) *Sara* : is a small bowl used for burning resins.
- (i) *Dip* : is an earthen lamp.

The above items are usually present in a few number in a household. The number depends on family size, necessity and means besides these on special occasion like 'Monosa' puja and 'Dak' puja the villagers need terracota elephants and horses. These are brought from Silda weekly market.

Most of the above mentioned household pots of Kodapura are coming from Kendapara. Potters from this village come to peddle their ware on every Sunday and Wednesday. Sometimes the Santals of Kodapura travel to Kendapara to buy pots. Pots are also bought from weekly market at Kodapura. Once a month potters from Dahijuri, a village about 10 miles south east, come to sell their pots. These pots are more in demand for their better quality. Santals mostly pay for their pots in paddy. Price of each pottery type is fixed in terms of measures of paddy. *Hanri*, *Kalsi* and *Taoa* are costliest items. Perhaps functional need determines price. At weekly market the pots are purchased with cash.

THE POTTERS CONCERNED

Village Kendapara is almost a homogeneous one dominated by potters. The potters are a caste. Pottery is a caste based hereditary occupation. Raw material needed for the pots are clay, sand and fuel for firing the pots. Excepting a few small pots, all the pots are made partly on the wheel.

and partly by hand. At Kendapara, Hanra, Hanri, Kalshi etc. are made in this manner. The wheel is made of wood, straw, rope and mud. It has a outer circular rim and a central disc. The central disc is joined with outer rim by means of four spokes. The wheel rotates on a pointed pedestal fixed to the ground. On the lower surface of the disc a small pebble is attached with a central groove.

Part of a pot is made by turning on the wheel, then remaining part is completed by beating with paddle and anvil. Sometimes the pot is slipped. The dried pots are then fired in a kiln. In general the kilns are provided with thatched roof. Within the kiln the pots are arranged interspaced with firewood. The kiln is finally covered with mud paste. The whole process of pot making involves with special skill, knowledge and technology. Non potters do not possess the capability of pot making. Long period of learning is needed. Apprenticeship starts at early youth (Das *et al.*, 1981)

Pots are made both for tribals and non-tribals but according to Kendapara potters tribals are the main customers. Tribals prefer wider mouthed pots. Demand of pots increase at the time of tribal festivals. Then they need pots for brewing rice beer. Non tribals mainly need cooking pots. Santals has got a custom of throwing away old pots and buying new ones at the time of 'Makar' festival. This usually takes place by middle of January. Both men and women from Kendapara carry their ware to Kodapura and also other tribal villages. These are carried on the head in a basket. Also they hang two baskets at both ends of a pole and carry them on the shoulder. The former way is followed by the women mainly. Men carry in both the ways.

POTTERY IN TRIBAL CULTURE

Steward (1955) brought in the concept of culture core. He included the features closely related to subsistence and economic activities. Social, political and religious patterns are included by him in the core. Usually the inner core of the culture i.e. religion and ritual, remains unchanged (Orans, 1965). Change in the environment and acculturation process brings in traits from other cultures. With Santals house type, food habits, process of cooking, domestic utensils, appliances, economic pursuits, dress, ornament, song and dance changed but religion and ritual of the core remained unchanged.

Hansda (1980) made a detailed study of transformation of Santal culture and language. He pointed out that among Santals the culture core is made of pure form of religious and ritual activities. This includes festivals connected with agriculture, animal husbandry and hunting. The rituals and festivals are observed at different times of the year. Use of earthen pots with traditional ritual part is not found. They prefer containers made out of plant parts. Acculturation has introduced some semi religious festivals where earthen pots had found their place. Rituals connected with life cycle of the Santal, viz., birth, hardly have the use of earthen pots. The remnants of birth are buried wrapped in leaves. This is found more with those who have retained more of the cultural traditionalism mostly due to isolation. Hansda (1980) farther made a study of the names of cultural items. He has shown that names for kitchen, dinning and other household utensils are similar to local hindu names or a slightly changed versions of the same. The terms are mostly unchanged with hunting and agricultural implements. On the basis of evidences available it may be said that pottery is a later infiltration in the material culture of Santals.

PREHISTORIC EVIDENCES

Reports on Neolithic artefacts from this area is coming from nineteenth century (Ball, 1875; Anderson, 1917). Excavations are carried out at some important sites. They are Chirand (Narain, 1970; Verma, 1970-71), Barudih and Dugni (Sen, 1969; Ghosh, Ray and Chatterjee, 1984) in Bihar, Kuchai in Orissa. The present authors also carried out trial digging at Porihati, a village not very far from Kodapura and Kendapara.

Cultural material is coming from humus rich blackish clay of recent origin. Pottery is found from the beginning of neolithic stage. Earliest form of pottery are grey, red and black. These are curde, thick and ill fired. Wheel made pottery followed hand made pottery. The grey and red types developed and are made on wheel. Hand made potteries continued together with wheel made ones. Study of major traits like texture, tempering material, technique of manufacture, firing, slip, colour and form of pottery of both prehistoric and modern times show a continuity of the trait complex from neolithic to the present day (Das, Ray and Ghosh, 1982).

The authors have collected a large number of fluted cores in course of exploration along Sanjal river valley and its tributaries (Ghosh, et al, 1934). These fluted cores are found from the surface mixed with neolithic celts, metal slags and potsherds. The fluted cores are decidedly different from the fluted cores which are a mere biproduct of punch technique. Narrow parallel scars are found on the longitudinal surface. Usually these fluted cores have elongated/cylindrical shape. One end is broader than the other end. The broader end is sometimes rounded by farther removal of flake scars. The narrow end is slightly flattened. At this end halfway up the length two or three ridges are carved. Morphologically these have a similarity with the bolt type of arrow head used by the Santals as a hunting weapon. This is usually used for fowling and hunting small games. The idea behind is to stun the prey and capture it without any blood shed. The bolt has got every similarity with fluted cores. Raw material for the former is wood and latter is stone. These further provide with evidence for continuity of at least one aspect of hunting implement from ancient to the modern times.

CONCLUSION

Antiquity of pottery tradition in this area poses questions, like the relationship of the tribals in the region to the potters and pottery of early times. If the tribals continued from a very early time in the area, were they a separate group even during neolithic time? Present work has shown that use of pottery entered Santal culture through the process of acculturation. Both religion and ritual practises and linguistic studies suggested hunting as the earliest form of subsistence mechanism with the tribals in which pottery in general perhaps had no significant place.

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The Rationales of Becoming Baha'is : A Study Of The Ideological Integrity

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Abstract . In a period of one hundred and a fifty years, the Baha'i faith has emerged to be a "divinely" organised manifestation for brining about all-implicit oneness and unity of the world in both the realms of "changeable materiality" and "universal spirituality". A sample of Baha'i population of West Bengal, textual and historical records and reports preserved by them, their organisational experiences have been studied for looking into the practical integrity of the ideological rationales of becoming Baha'is. For an individual, the independent option of achieving a Baha'i identity — though includes a formal process of activities - is said to be unending and enduring phenomenon with regard to the continuous ideological search and duties. Thus, the ideological concerns are told to be the means and goals of knowing the Baha'i faith. The authors observe the differentiation and integration as the consequences of the practices. Because of the scarcity of anthropological studies regarding the Baha'is in India and abroad, the authors have their first choice of presenting a normative understanding of the Baha'is. The historical and functional concerns of their ideological practices ranging from individual to organisation have been depicted.

The authors were urged to study some less heard-of people of their neighbourhood, the Baha'is of West Bengal. The religious population spread over more than 200 countries of the world are territorially distributed over the province-based localities of villages and towns of India. The resident-members of these localities meet at assembly/or council, like that in Calcutta, in several daily and culturally significant occasions. It has become a long story of the authors' contacts with the Baha'is connected to Calcutta. That enthusiastic journey in the varied cultural spaces, both past and present, of the Baha'i individuals enable the authors to find out numerous themes effective in studying the Baha'i community and its culture. They presently endeavour to set forth a format of study which may focus on some significant aspects of their culture which are supposed to differentiate itself from the others and to effect some larger integration of mankind. With an explicit history of about one hundred and a fifty years, the ideological rationales are said to manifest in the planned and ceaseless development of the faith leading to the ultimate "oneness" and "unity" of the world. Thus, their logic suggests that any moment of succeeding history is ideal for realising the integrity of the ideological manifestations in their empirical practices of becoming Baha'is. Therefore, the authors, hoping an enquiry into the integrity of the culture in time and in space have justifiably looked into the records, the plans, the reports and the organisational reality. The theme is supposed to encompass the entry into community, the subsequent phases of religious, cognitive, social, political, economic and other experiences of the Baha'is.

The individual Baha'is, interviewed and observed, are those living in different rural and urban localities of West Bengal and those representing higher offices of the Baha'i organisation, coming to meet at the State Baha'i Council in Calcutta. They also gave us religious texts, records and reports, preserved in the council office and extended all sorts of sincere cooperation in

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making our study of recorded elements and organisational experience successful. The Baha'is, enquired so far, have emphasized that at first, one should know the faith, not the people adopting the faith. It is, according to their culture, the texts written by the founders of the faith are the principal means of knowing the truth independently. At the sametime, they cannot deny the fact that there had been some honest and successful empirical attempts to study their history and culture. The present investigators used both the means of reaching the succeeding phases of the study.

India is said to have the largest and longest establishment of the Third World Baha'i communities (e.g., Garlington, 1975; Huddleston, 1976; Hampson, 1980; Smith, 1982; etc.). Whilst there had been a number of Indians amongst the ranks of the Babis - including one of the Letters of the Living, among them four fought at Tabarsi. One was claimant of spiritual leadership (Brown, 1893). Over the early decades of the 20th century individual Sikhs, Ahmadiyyas and Hindus became Baha'is, the most effective section of the community remained a Persianised Muslim or Zoroastrian section of the urban middle class. American international teachers came to supplement those Iranian Baha'is. Replacing their elitist methods (Baha'i World, Vol. XIII) after 1961, by virtue of a decisive breakthrough effective measures were adopted to convey Baha'i teaching to rural audience. Visual aids, music and singing were gradually brought to use for the large section of less literate people. Above all, for greater intelligibility and penetrability the teachings were presented in terms of the native languages and cultural symbols of Hindus (Garlington, 1975). The structure of developing administration, however, increases the importance of the higher centres of administration, generally situated in some urban localities. As for example, State Baha'i Council of West Bengal is situated in Calcutta. Thus Baha'is available in Calcutta are expected to serve four major purposes :

- i) meeting some Baha'is in their own setting;
- ii) meeting the Baha'is of both urban and rural backgrounds;
- iii) meeting the Baha'is for a longer period of time as the investigators stay in Calcutta;
- iv) closeness to the sources and central control of the older and recent cultural mechanisms of study, valid at least for a region of West Bengal.

The history of Babism, Baha'i faith and their adherents have been studied in different disciplines (e.g., Momen, 1982; Smith, 1982; Taherzadeh, 1974; Browne, 1910; Miller, 1931; Garlington, 1975; Akhavi, 1980; Cooper, 1985; Alexandar, 1974; etc.). The major principles regarding which all these devoted Baha'is sustained their interpretations stand as follows :

- a) The human world is going to achieve the inevitable oneness.
- b) The truth must be investigated Independently.
- c) The Baha'i is also an universal faith based on the inclusiveness of the spiritual essences of all great religions.
- d) The Baha'i is also the most advanced faith owing to its functional compatibility with the need of the time and its breadth of cosmic plan and as it had been foretold by the doctrines of the great religions.
- e) Science and religion go hand-in-hand.
- f) Universal education for everyone is going to be achieved inevitably.

- g) All races are equal.
- h) Equality of sex is true and should be achieved socially.
- i) There must be a functional & universal auxiliary language.
- j) All prejudices should be abolished.
- k) A true Baha'i does not take alcohol; alcoholism must be universally prohibited.
- l) Solution of the problem of extreme economic stratification should be achieved.
- m) History says about the insurrection of the faith at the cost of numerous sanctities for the good.
- n) A Baha'i should not participate in politics.
- o) The Baha'is should remain loyal to the government or the state.
- p) There should be no priesthood of any kind; communications between God and a human being must be direct and without any burden of rituals and customs.
- q) Even in the major events of life, e.g., birth, marriage, death, etc., the social and religious processes should remain simple.
- r) Irrespective of the special backgrounds of the Baha'is they lived in a very face-to-face social relations, as if, in a big family.
- s) Any non-Baha'i cannot contribute to Baha'i fund.
- t) Finally, there will be a world union governed by the representatives, elected in perfect democratic principles, of all peoples.

Thus, it becomes clear why each detail of every theme is able to draw attention of a social scientist, especially with the profound quest for the relevance. All the Baha'i informants, mentioned above and met in the preliminary probe, carry on the identity on the basis of the awareness of the themes. They express deep desire to explore more and to enrich their beings in the endless journey of becoming more proper Baha'is. They are used to interpret the principles with all their feelings and experiences. The analytical urge, capacity and experience of the informants differ. So the level of practice and realisation differs as reflected in their life and interpretation. However, the empirical generality of the manifestation of the faith among the Baha'is confirms a strong 'we-feeling'. It is not only the faith in their understanding of essence but its mere practising aspects, like, the administrative organisations, spreading of the principles and teachings, laws and obligations etc. which are observed to usher in the viability of the differentiating as well as integrative processes. The Muslims accepting the faith, encounter coercion in the social surroundings in which they live. It is incomparable to that in case of a Hindu Bengalee taking the faith more smoothly. The situations are said to vary also within a religion and from place to place. All these preliminary understandings of ethnicity led the investigators to the closer contacts with the Baha'is and obviously with the available texts concerned.

THE EMERGENCE

The textual records and materials given by the informants may selectively be arranged to produce the following account.

ANTECEDENTS : A profound knowledge of Islam, both doctrinal and historical, is a prerequisite to the understanding of its emergence. The doctrine of the *lthna ashasiyya* division of the Shia or

Sect of the Twelve Imams is regarded as that form of Islam of which Persia has been the stronghold from the earliest Muhammadan times. Since the 16th century of this era it has been the state religion. According to the series, the Sect of Twelve was concluded by the Twelfth Imam of Imam Mahdi. But their belief suggests that the world can not do without an Imam and since this last one who got the succession from his father in A. H. 260 (A. D. 873-4) disappeared from mortal ken in A. H. 329 (A. D. 940-1), it is believed that he never passed away and he is living in the mysterious city of Tabulga or Tubulsa surrounded by a band of faithful disciples. He will live there until the end of time. At that terminal point he will "come out" and will "fill" the earth with justice. It is to be noticed that the 'Manifestation' of Mirza Ali Muhammad or Bab took place, as already said in A. H. 1250, which is exactly thousand years of the succession of the Imam Mahdi to the Imamate or in other words, the completion of a millenium of 'occultation'. Mirza Ali Muhammad at his early career proclaimed himself to be Bab or Gate. On the death of Sayyed Kazim his sincere followers were naturally compelled by their doctrine concerning the Perfect Shi'ite to search out his successor. There were two claimants, Mirza Ali Muhammad who on May 23, 1844, within a short time of Sayyed Kazim's death, announced himself to be the Bab (or Gate whereby communication closed since the end of the Minor Occultation was freshly started between the hidden Imam and his trustworthy followers) and whose followers were consequently called 'Babis' and Haji Muhammad Karim Khan, who was recognised by the conservative or stationary Shaykhis school, wherefrom the immediate origin of early Bab doctrine may be sought but little scholarly effort has yet been made for a critical study of the works and doctrine of Shaykh Ahmed and Sayyed Kazim. The Baha'ism has got the formation in the contributions of four successive personalities.

Bab : The Bab was very young when He told people about the Message which God had given Him. He was only twenty-five years old. A Beautiful city in the south of Iran, called Shiraz, was the birthplace of the Bab. Mulla Husayn became the first disciple of Bab. The Bab then gave him the title of Babu'l-Bab meaning gate of Gate. That night is said to be the beginning of a new era. The Baha'i calendar begins from that Year. Bab's prayers succeeded and His promise was fulfilled. Nineteen years after one of the Missions, Baha'u'llah openly declared that " He was the Promised One Whose coming had been foretold by all the Manifestations of God in past ages."

Baha'u'llah : On April 21st 1863, Baha'u'llah proclaimed to the world that " The Revelation which, from time immemorial, hath been acclaimed as the Purpose and Promise of all Prophets of God and the most cherished Desire of His Messengers, hath now.....been revealed unto men". When Baha'u'llah declared it, He was a prisoner at the hands of two powerful monarchs, and He was being banished to Acre, "the most desolate of lands". Forty six years before this announcement, Baha'u'llah was born in the house of a distinguished Minister of the royal court of Iran. The fame of Baha'u'llah soon spread throughout Baghdad and other cities of Iraq, and many people came to the exiled Prisoner in order to receive His blessings, peace, guidance and inspiration. Although Baha'u'llah was sent to Acre as prisoner for life, He chose to leave that fortress city nine years after His arrival. By this time, His great personal charm had made such friends of all those around Him - even His hard-hearted jailor - that no one objected to His leaving His prison. Baha'u'llah spent the remaining years of His life in a place outside the city of Acre where He passed away to His heavenly Kingdom on May 29th, 1892.

Abdu'l-Baha : The report mentions that when Baha'u'llah passed away He left the execution of

His Divine Plan in the hands of His son. He appointed Abdu'l-Baha as the Centre of His Covenant and asked His followers to turn to Him for guidance. The word Abdu'l-Baha means the servant of Baha. He was the eldest son of Baha'u'llah and was born on the 23rd of May, 1844, the very same night that the Bab declared His Mission. A blessed son was born to a blessed house at a blessed hour. In America, Abdu'l-Baha laid the cornerstone of the first Baha'i House of Worship in the West which is now a beautiful building dedicated to the glory of the Cause of God. Abdu'l-Baha's travels in Europe and America produced wonderful results. The Baha'i Faith was established in many countries. The Master passed away from this life in the Holy Land on the 28th of November, 1921.

Shoghi Effendi : The Baha'is believe that "With the passing of Abdu'l-Baha the Baha'is lost a loving father but in Shoghi Effendi they found a 'true brother". Shoghi Effendi was born in the blessed household of Abdu'l-Baha and His father was a close relative of the Bab. He was only the twenty-four years of age when he became the Guardian of the Cause of God. During his lifetime the Message of Baha'u'llah was carried to over 251 countries of the world including all the places mentioned by Abdu'l-Baha in the Tablets of the Divine Plan. Shoghi Effendi also drafted a Ten-Year Plan which ended in 1963. According to this Plan, all the Baha'is of the world were to work closely together in taking the Message of Baha'u'llah to the remaining islands and territories of the globe where the Baha'i Faith had not yet been established.

THE POPULATION

The population of the Baha'is, according to recent edition of Encyclopaedia Britannica, shows that the people have a status comparable to four major religions of the world. The position of the Baha'is in the world in comparison to four major religions is given in a numerical terms.

Religion	World	Asia	Countries
Christian	1,783,660,000	257,926,000	254
Muslim	950,726,000	625,194,000	172
Hindu	719,269,000	714,652,000	88
Buddhist	309,127,000	307,323,000	86
Baha'i	5,402,000	2,630,000	205

The most recent official reports of the Baha'is (1993) present world and Indian overviews in some population and organisational contexts.

A World Overview (1993) :

i)	Number of Baha'is more than	5,000,000
ii)	Number of Local Spiritual Assemblies	18,232
iii)	Number of Localities where Baha'is reside	116,000
iv)	Language in which Baha'u'llah's Writings have been translated	800
v)	Publishing trusts	26
vi)	Radio stations	7
vii)	Schools	741
viii)	Literacy programmes	203
ix)	Other developmental projects	670

Overview of India (1993)

i)	Total number of Baha'is (Adult 15,33,802; Youth 3,26,720; and Children 3,61,942)	22,22,464
ii)	Number of Local Spiritual Assemblies	4,156
iii)	Number of Localities where Baha'is reside	30,215
iv)	Number of Indian languages into which Baha'i Writings have been translated	20
v)	Development Institutes	4
vi)	Literacy programmes	35

The individual Baha'is interviewed present a wide coverage of their past backgrounds of diverse spatial, educational, cultural (e.g., religious, linguistic) and occupational identities. Table :1 showing the age and sex of the individuals confirms that below 15 years there is no Baha'i to meet the regular programmes. Actually it is the age of accepting the Baha'i identity according to the formal organisational process of enculturation. Being an offspring of Baha'i parents, a boy or a girl is independent in achieving the formal status of a Baha'i, but not before that age. The number of the males is considerably higher than the female in accepting the religion or at least in meeting regularly. After the age of 50 years the Baha'is are not very frequent in the regular meetings. Table : 2 and Table : 3 reveal that the acceptance of the ideology is concentrated in some districts of West Bengal and the distribution is more or less even. None of the Baha'is met, is illiterate (Table : 4). The past cultural backgrounds (Table : 5 and Table : 6) of the individuals uphold striking diversity both with respect to community-origin and language of the Baha'is. The occupational identities (Table : 7) also suggest wide range of present types, all belonging to the culturally spoken "middle-class" status.

THE ENTRY INTO THE COMMUNITY

It has now been established that there are ample grounds for accepting that the people from different backgrounds of religion, residence, education, language, occupation etc. have got the Baha'i identity. The very close and justified enquiry establishes the causes and processes of achieving the individual's membership of the Baha'i community. Becoming a Baha'i is always a

question of individual's judgement and impact of Baha'i collectivity. Almost the hundred of being Baha'is have been interpreted in terms of the ideological contexts. Everyone felt his or herself in the process of becoming a Baha'i.

The formal process of expressing the desire of achieving the Baha'i identity is to fill card. The card takes a few accounts of the individual like (i) name, (ii) age, (iii) residence occupation etc.

In order to establish that always there is a phase for taking the decision of being Baha'is intervals between the contact of the Baha'i faith and card-filling have been enquired (table 8). After becoming Baha'i a person endeavours to get adjusted in family of non-Baha'is. The process of accepting the religious identity (table : 9) and Baha'i-non-Baha'i compositions of the families to which the Baha'is belong (table : 10) show how adjustment and integration ensue from the process becoming Baha'is individually.

The Baha'i informants are almost all used to describe the world as a whole creation and to distinguish the material aspects from the spiritual aspects of life, to perceive the order and purpose in both. They recognise that a faith has its mundane understanding about the world, its customs, rules, events etc. which are vulnerable. The spiritual essence is unchangeable in nature and ever resourceful to the people searching it. The able spiritual leaders have the capacity to launch the proper order of the time. They instruct people for setting up the proper means and goals. Thus, for the Baha'is the malleable society has always been in the journey towards the proper goal of the time presupposed by the proper founders of all great regions. The present phase of society is said to have undergone stress and strain due to improper guidance and unfulfilment of the goals. The critical evaluation of the civilisation has the prerequisite of independent role of individual, proper perception, role of holy law, belief in relevant teaching, universalisation and equality. It is expected to lead to the goals of social reforms and reconstruction. Hence worldwide community system of the Baha'is launched uniform schemes of development like Ten-year Global Crusade (1952-53), Baha'is first Nine-year plan (1963-71) being followed in turn by Five (1974-79), Seven (1979-86) and Six year plan (1986-92). The ethnic experiences have become much widened for more positive integration. Some of the significant aspects of their ideological construct may further envisage the integrative and distinctive functions.

INDIVIDUAL

If the individuals of different families stop imitating their forefathers and search for the truth individually, they would all reach the same conclusion about life and become united. Independent search and decision serve also the modern need of rationality and knowledge.

Anyone born in a Baha'i family is not compelled for being a Baha'i. He or she is given time to enquire after the reality. Even, if one is willing to adopt the faith, he or she is awaited till the adult age of 14 years. That is the reason no single Baha'i has been found to be below 15 in the studied population. One is thus bound to the community or their society at large. At the same time individual is subordinated to the supreme in the precise sense that the almighty Creator, the omnipotent is greater than what can one imagine. He is the unknowable essence.

There are, of course, some prescriptions governing different aspects of life, but becoming a Baha'i is more central to all laws. Becoming a Baha'i means to have conviction in the Oneness of God, oneness of religions and oneness of mankind, to realise that religion is progressive and continuous and it's for the sake of unity rather than disunity. According to a Baha'i, all religions are divine in origin and are equal. In respect of the duty of a Baha'i, the informants discerned that a Baha'i should (a) study the cause, (b) practise the teachings and (c) spread its message. Very allied to the understanding the proper duty of a Baha'i stands the saying at Baha'u'llah, "God hath made it incumbent upon every soul to deliver His cause according to his ability". So the cause of God has its universal teaching.

THE UNIVERSALISATION AND THE EQUALITY

The main sources of such belief are represented mainly by the (i) universalisation of language, (ii) universalisation of education, (iii) equality between two sexes and (iv) equality of races.

i) **Language** : It is the teaching of Baha'u'llah in one of His laws that a common language must be taught in every part of the world, so that every person will learn that language besides one's own native language. In this way, understanding of each other may usher in the integration of the linguistic communities of the world.

ii) **Races and ethnic groups** : Equality of races and ethnic groups of the world presents almost the similar function for world integration. All races and ethnic groups are treated alike. They say that living with other faiths is also a teaching of their faith. The religious, ethnic and/or linguistic backgrounds of the studied population have already been accounted for.

iii) **Education** : If the parents can afford to educate their children but neglect to do so, then the Spiritual Assembly must force them to see to their education. If the parents are poor, the Spiritual Assembly must provide for the education of the children through the funds of the community.

iv) **Sexes** : Equality between men and women is interpreted by the Baha'is by a common analogy. Abdu'l-Baha says : "Humanity is like a bird with its two wings : the one is man- the other woman. Unless both wings are strong and impelled by some common force, the bird cannot fly heavenward."

MILLENNIAL EXPECTATION, SOCIAL REFORM AND RECONSTRUCTION :

One of the major contexts of Baha'i faith is the gamut of religious and social elements centring round the ideas of the transformation of the world. These concerns involved both a clear millennial vision and a programme of more 'secular' social reformism and reconstruction. Both the elements strongly evoke a religious ethos and both are said to present the latest stage of Godly plan for mankind. The plans and their consequences are so vast that they require exclusive treatments.

AUTHORITY AND LEADERSHIP

The regard for authority and charismatic leadership has been reported to be powerful in the formative phase of the faith. In one of the strongest forms this conceptual orientation of the Baha'is was centred on an individual who was regarded as a divine incarnation. Bab's idea of validating the authority rushed entirely on his claims to be some kind of unique divine intermediary. The divine authenticity of His authority was reinforced by the exposition (a) of His own spiritual realm, (b) of His response to Divine Summons and (c) of the dialogue with the "Spirit of God" which are central to His mission. The authority is made supreme to all other great religions in the growth of universalism (or graceful attitude towards all older religious thoughts) and liberalism (or the acceptance of modern scientific rationale, scientific knowledge as compatible with religious knowledge). Even His experience of Divine Revelation, permeated by the surviving accounts of the lives of the Buddha, Moses, Christ, Muhammad, Krishna and such others. Moreover, the hidden knowledge of salvation promotes the authority of the founders and later administration system above common human logic. Individual authority is inherited by the Bab then by Baha'u'llah, next by Abdu'l-Baha and finally by Shoghi Effendi, in charge as the guardian of the Faith. After that it is the established administrative system that upholds authority.

ADMINISTRATION

The administration is composed of many parts, all linked to one another. It comprises of the following structure : (i) Localities of villages or towns whose Baha'i members elect; (ii) Local Spiritual Assemblies (LSA); (iii) National Spiritual Assemblies (NSA) are elected by the Baha'is of countries, composed of the LSAs; (iv) Universal House of Justice is elected by all the Baha'is of the world through their NSAs. Baha'u'llah has ordained that in every locality where there are nine or more adult Baha'is, a Spiritual Assembly must be elected. As an administrative body this Spiritual Assembly may serve the local community to which it belongs. Regarding the election of their Spiritual Assembly, there are some distinct points which should be taken into consideration. Apart from the development of Universal House of Justice, there are six more major goals of the Baha'i administration in the international levels. The social networks are to be built by the goals like (a) the international teaching centres, (b) collection and classification of the sacred texts, (c) restoration and maintenance of holy places, (d) growth and development of the Baha'i world centre, (e) building of the Baha'i international community and (f) emancipation and protection of the faith.

FUNCTIONS OF A LOCAL SPIRITUAL ASSEMBLY

The primary function of a Spiritual Assembly is to serve the religious, economic and educational interest of the Baha'is in the locality in question. The other important duty of a Spiritual Assembly is to try to develop amity, unity, love and happiness among the believers. Besides educational and economic functions every Spiritual Assembly must make arrangements of regular meeting of the friends, the feasts and the anniversaries, and special gatherings for promoting social, intellectual and spiritual interests of their fellow-men.

RANKS IN A SPIRITUAL ASSEMBLY

After election of the nine members to the Spiritual Assembly, the first thing is to assemble and hold their first meeting formally. Every Spiritual Assembly has the following portfolios : i) A Chairman, who is to be entrusted to conduct the meetings and help the Assembly to arrive at some decision; ii) A Vice-Chairman, who conducts the meetings of the Assembly whenever the Chairman is unable to attend it; iii) A Secretary, who keeps a record of all the work of the Assembly, and through whom a Local Spiritual Assembly keeps contact with the rest of the Baha'i world; and iv) A Treasurer, who is in charge of the Fund of the Assembly. This election is also carried out by secret ballot and without any sort of propaganda.

POLITICS : POLARITY OF POLITICAL QUITISM AND LOYALTY TO GOVERNMENT

It may appear repetitive to mention that a Baha'i has no favour for any political pioneer in the form of a purity who may constitute the government. Whatever the constitution of the government, the Baha'is under its jurisdiction will remain loyal to it. According to principles of Baha'u'llah, one Baha'i cannot be faithful to one's own religion if one is not faithful to the government.

SOME RELIGIOUS EXPRESSIONS

They may be explained according to their words. They include their subjective ideas engulfed in their objective behaviour regarding temple, prayer, fasting, holy days and fund.

Temple : Every human being is welcome in Baha'i temple to see the sacred writings of all religious being read in it. Even the structure of the Baha'i temple is a symbol of unity in itself. Nine sided building with nine doors, each representing nine major religions of the world is indicative of the basic unity of all religions.

Prayer : It is understood that Baha'i prayers, though compulsory, should not be taken as a kind of ritual or ceremony. Usually one person reads or chants from the Holy Writings in the meeting while the rest listen and meditate upon the words. Three types of prayers have been revealed by Baha'u'llah : (i) once in every 24 hours, called the long obligatory prayer; (ii) a shorter prayer thrice in a day, in the morning, at mid-day and in the evening; and (iii) a very short prayer once everyday at noon. A Baha'i is free to select any one type of prayer available in Baha'i prayer books.

Fasting : According to the Baha'i calendar there are four and sometimes five days between the 18th and 19th months of the year, called the "days of Hao" or intercalary days. During these days Baha'is entertain their friends and relatives or feed the poor amongst them. With the beginning of the 19th month, the month of Loftiness (*A/ā*), the period of the fasting starts. Throughout the nineteen days of fasting Baha'is do not eat or drink anything from sunrise to sunset. They get up at dawn for prayer. Then they eat food before the sunrise and have nothing more during the day until the sunset. Breaking the fast at sunset after prayers becomes the custom.

Holy Days : The Baha'is observe nine holy days throughout the year on which they should not work. Some special event of great spiritual importance take place in these holy days. These days are treated distinctly from the ordinary day. Out of the nine holy days, seven are the Feast days and the rest commemorate the martyrdom of the Bab and the ascension of Baha'u'llah. These

Baha'i Holy Days are : March 21-Feast of *Naw-Ruz* (New Year); April 21-First day of *Ridyan* — Declaration of Baha'u'llah (1863) at 3 p.m.; April 29-Nineth day of *Ridvan*; May 2—Twelfth day of *Ridvan*; May 23 — Declaration of the Bab (1844), two hours and eleven minutes after sunset on May 22; May 29 — Ascension of Baha'u'llah (1892) at 3 a.m.; July 9 — Martyrdom of the Bab (1850) at about noon; October 20 — Birthday of the Bab (1819); and November 12 — Birthday of Baha'u'llah (1817).

Fund : The people of the world in present day is thought to be "homeless". Hence they need fund for establishing institutions of the cause, building centres Houses of Worship, etc. The Baha'is think it to be their spiritual obligation and the test of faith. Any non-Baha'i can not subscribe to the Baha'i fund utilised internationally.

CONCLUSION

All the empirical areas of understanding of the Baha'is have established that people from different backgrounds have been finding out different causes and conditions to achieve a new integrative identity. An individual on the process of becoming a Baha'i obtains two facets of his or her identity. First is the promotion to a developed all-embracing consciousness, second becomes the rationalised respect for the previous and other religious and cultural backgrounds. One's Baha'i faith in the equal status of the spiritual essence of other main religions suggests a legitimate coexistence with other religions and inevitable evolution to 'Baha'i itself. Thus, the faith for world integrity is seen by them to impart the identity, sometimes, beyond differentiation.

From the analytical integrity or oneness of the faith a number functional dimensions of critical outlook may be derived. Such critical outlook may have retained them resistant to the excess of material interest of the present consumerist civilisation. This may be the reason why the "hopeful" subjectivity of the faith is not making people "crazy" about it. The more effective and illustrative realisation of the scopes of the present Divine Manifestation is believed to cause the coming plans of expansion and consolidation of the faith more successful in social reformism and reconstruction. The investigators have experienced that Baha'i faith is so vast that even a satisfactory coverage of any perspective may appear an attempt of grasping the part of the expansive whole.

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APPENDIX

TABLE 1 : DISTRIBUTION OF THE BAHAI'S BY AGE AND SEX

Age group	Male		Female		Total	
15-19	6	(6.38%)	1	(1.06%)	7	(7.44%)
20-24	15	(15.95%)	5	(5.31%)	20	(21.27%)
25-29	12	(12.76%)	6	(6.38%)	18	(19.14%)
30-34	13	(13.82%)	5	(5.31%)	18	(19.14%)
35-39	8	(8.51%)	5	(5.31%)	13	(13.82%)
40-44	6	(6.38%)	1	(1.06%)	7	(7.44%)
45-49	7	(7.44%)	—		7	(7.44%)
50-54	1	(1.06%)	—		1	(1.06%)
55-59	3	(3.19%)	—		3	(3.19%)
Total	71	(75.53%)	23	(24.47%)	94	(100.00%)

TABLE 2 : BACKGROUND OF BIRTHPLACE OF THE BAHAI'S UNDER STUDY

Place of Birth		No. of Person		Total	
		Male	Female		
I	Bankura Dist. (W.B.)	17	4	21	(22.31%)
N	Purulia Dist. (W.B.)	17	3	20	(21.27%)
D	24 Parganas (S) Dist. (W.B.)	10	4	14	(14.87%)
I	Burdwan Dist. (W.B.)	5	3	8	(8.51%)
A	Hooghly Dist. (W.B.)	7	—	7	(7.44%)
	Calcutta (W.B.)	13	7	20	(21.27%)
Iran		2	2	4	(4.23%)
Total		71	23	94	(100.00%)

TABLE 3: DISTRIBUTION OF THE BAHAI'S UNDER STUDY BY RESIDENCE

Present Residence		No. of Person		Total	
		Male	Female		
	Bankura Dist. (W.B.)	15	4	19	(20.18%)
	24 Parganas (S) Dist. (W.B.)	11	5	16	(17.01%)
	Purulia Dist. (W.B.)	17	3	20	(21.27%)
	Hooghly Dist. (W.B.)	7	—	7	(7.44%)
	Burdwan Dist. (W.B.)	5	2	7	(7.44%)
	Midnapur Dist. (W.B.)	1	1	2	(2.12%)
	Murshidabad Dist. (W.B.)	2	1	3	(3.19%)
	Calcutta (W.B.)	13	7	20	(21.27%)
Total		71	23	94	(100.00%)

TABLE 4 : EDUCATIONAL STANDARD OF THE BAHAI'S UNDER STUDY

Age group	Literacy		Madhyamik		H.S.		Graduation		Post Graduation	
	M	F	M	F	M	F	M	F	M	F
15-19	3(3.19%)	1(1.06%)	3(3.19%)							
20-24	3(3.19%)	3(3.19%)	5(1.06%)	1(1.06%)	1(1.06%)		5(5.31%)	1(1.06%)	1(1.06%)	
25-29	1(1.06%)	3(3.19%)	5(5.13%)	2(2.12%)	1(1.06%)	1(1.06%)	5(5.31%)			
30-34	2(2.12%)	2(2.12%)	1(1.06%)	1(1.06%)	5(5.31%)		5(5.31%)	2(2.12%)		
35-39	1(1.06%)	4(4.23%)	3(3.19%)	1(1.06%)	2(2.12%)		1(1.06%)		1(1.06%)	
40-44	2(2.12%)		3(3.19%)	1(1.06%)	1(1.06%)					
45-49	3(3.19%)		2(2.12%)		2(2.12%)					
50-54	1(1.06%)									
55-59	3(3.19%)									
Total	19(20.12%)	13(13.82%)	22(23.40%)	6(6.38%)	12(12.76%)	1(1.06%)	16(16.38%)	3(3.19%)	2(2.12%)	

TABLE 5 : ETHNIC COMPOSITION OF THE BAHAI UNDER STUDY

Tribal		Muslim		Non-Tribal		Persian	
M	F	M	F	M	F	M	F
Layek (2)		Hak (4)	Khanon (2)	Ghosh (7)	Ghosh (2)	Hemmati (1)	Hemmati (1)
Murau (3)		Rasid (2)	Rasid (1)	Mahato (9)	Mahato (2)	Nazmi (1)	Nazmi (1)
Kisku (1)		Hussain (2)		Roy (4)	Roy (2)		
		Rahaman (4)		Panda (3)	Jhunjhunwala (1)		
		Masid (3)		Chell (1)			
		Haque (2)		Das (4)	Das (2)		
				Banerjee (4)	Banerjee (3)		
				Dey (5)	Dey (2)		
				Bose (4)	Bose (2)		
				Mukherjee (2)			
				Bagchi (1)			
				Mahapatra (2)	Mahapatra (2)		
Total 6		17	3	46	13	2	2
6.39%		18.08%	3.19%	48.93%	19.14%	2.12%	2.12%

TABLE 6 : DISTRIBUTION OF BAHAI'S UNDER STUDY IN THE LANGUAGE COMBINATION (WRITING, SPEAKING AND UNDERSTOOD)

Languages Used		No. of Persons	
	M	F	Total
W B	10 (10.63%)	12 (12.76%)	22 (23.39%)
R BE	30 (31.91%)	4 (4.23%)	34 (35.14%)
I BG	11 (11.70%)	2 (2.12%)	13 (13.82%)
T BEH	15 (15.95%)	3 (3.19%)	18 (19.14%)
I UHS	1 (1.06%)		1 (1.06%)
N UEH	2 (2.12%)		2 (2.12%)
G EPU	1 (1.06%)	1 (1.06%)	2 (2.12%)
EPUB	1 (1.06%)	1 (1.06%)	2 (2.12%)
TOTAL	71 (75.53%)	23 (24.47%)	94 (100.00%)
S B	8 (8.51%)	9 (9.57%)	17 (18.08%)
P BE	29 (30.85%)	5 (5.31%)	34 (36.16%)
E BH	14 (14.89%)	4 (4.23%)	18 (19.12%)
A BEH	15 (15.95%)	3 (3.19%)	18 (19.12%)
K BHS	1 (1.06%)		1 (1.06%)
I UEHB	2 (2.12%)		2 (2.12%)
N EPUH	1 (1.06%)	1 (1.06%)	2 (2.12%)
G EPUHB	1 (1.06%)	1 (1.06%)	2 (2.12%)
TOTAL	71 (75.53%)	23 (24.47%)	94 (100.00%)
U B	8 (8.51%)	9 (9.57%)	17 (18.08%)
N BE	28 (29.78%)	5 (5.31%)	33 (35.09%)
D BH	13 (13.82%)	4 (4.31%)	17 (18.08%)
E BEH	17 (18.08%)	3 (3.19%)	20 (21.27%)
R UHS	1 (1.06%)		1 (1.06%)
S UEHB	2 (2.12%)		2 (2.12%)
T EPUB	1 (1.06%)	1 (1.06%)	2 (2.12%)
O EPUHB	1 (1.06%)	1 (1.06%)	2 (2.12%)
O			
D			
TOTAL	71 (75.53%)	23 (24.47%)	94 (100.00%)

B — Bengali, E — English, H — Hindi, U — Urdu, S — Sanskrit, and P — Persian.

TABLE 7 : OCCUPATIONAL STATUS OF THE BAHAI'S UNDER STUDY

Major Occupations		No. of Persons		Total
		M	F	
E	Cultivation	15 (15.95%)		15 (15.95%)
A	Service	11 (11.70%)		11 (11.70%)
R	Business	21 (22.34%)		21 (22.34%)
N	Tailoring	6 (6.38%)		6 (6.38%)
I	Teaching	5 (5.31%)	2 (2.12%)	7 (7.43%)
N				
G				
Non-Earning	Student	13 (13.82%)	8 (8.51%)	21 (22.33%)
	Housework		13 (13.82%)	13 (13.82%)
Grand Total		71 (75.53%)	23 (24.47%)	94 (100.00%)

TABLE 8 : INTERVAL BETWEEN FIRST CONTACT AND CARD FILLING

Sex	Interval between first contact and card filling					Total
	1/2 year	1 year	2 year	3 year	4 year	
Male	30 (31.91%)	25 (26.59%)	13 (13.82%)	2 (2.12%)	1 (1.06%)	71
Female	10 (10.63%)	10 (10.63%)	2 (2.12%)	1 (1.06%)		23
Grand Total (M + F)	40	35	15	3	1	94

TABLE 9 : DISTRIBUTION OF AGES IN WHICH THE PEOPLE HAVE ENTERED INTO BAHAI FAITH.

Age group	Age entering into	
	M	F
15-17	18 (19.14%)	5 (5.31%)
18-20	23 (24.47%)	8 (8.51%)
21-23	13 (13.82%)	7 (7.44%)
24-26	5 (5.31%)	3 (3.19%)
27-29	6 (6.39%)	
30-32	2 (2.12%)	
33-35	1 (1.06%)	
36-38	2 (2.12%)	
39-41		
42-44		
45-47		
48-50	1 (1.06%)	
Total	71 (75.53%)	23 (24.47%)

TABLE 10 : DISTRIBUTION OF THE FAMILIES WHOSE MEMBERS BECAME BAHAI

No of Baha'i in a family/ No of members of the family	No. of family with Baha'is			
	1	2	3	4
3	5	5	5	
4	1	2		1
5	5	5		
6	6			
7	5			
8	5			
9				
10	2			

Social — Cultural Profile of Games : Studies In West Bengal

ABHIJIT DAS

BISWANATH BANERJEE.

Abstract . The indoor and outdoor games have different patterns of cultural interaction. Individuals and groups are fully involved in those which are provided with common symbols, techniques, rules and creativity. In such cases variation can not be ruled out. This study compares and contrasts the structural-functional dimensions of the rural and urban patterns of human interaction connected with games in West Bengal.

The recreational activity called 'Game', is a cultural trait, as it possesses a theme, structure, function which are conceptual and symbolic. Game is a branch of play. Games differ from other forms of play in one basic respect; games always take the form of competition between individuals or groups of individuals. Their primary purpose, therefore, is to bring about interaction between the persons or groups involved. Games, moreover are conducted according to formal sequences of prescribed interaction, in which, within the limits of a specific technique, individuals originate to one another alternately, or one side tries to originate at greater rate than and tries to out act the other.

Games use certain symbols and techniques like ritual. Within the framework provided by a given technique, a complex game may be developed which controls the interaction of the individuals taking part, and yet allows them opportunities for significant variation in their interaction rate. This is particularly true in those games where more than one person plays in a team, where framework requires synchronization of the interaction of a large number of persons who in turn interact, in opposition, with the other side. Different styles of team play indicate the wide range of variation possible on a fundamental pattern within a precise time.

The tremendous importance of games in our own society is due to the fact that they provide regular opportunities for interaction within habitual techniques, using well-known symbols, ordinarily learned in childhood, and thus provide a constant framework in a society where changes in interaction rates are imposed by the technology and the institution.

Within the framework of the interaction afforded by different type of games, characteristic patterns of interaction are developed for each people and thus games are related to social systems.

Present paper states some structural-functional aspects of games in rural as well as urban spots of North 24 Parganas, West Bengal from contextual observation. The data were collected by direct observation and interviews.

II RURAL PATTERN

In the rural spots some indigenous as well as folk patterns and some borrowed patterns of games are played by the children and youth. The borrowed games are mostly of western in origin and came by contact. The indigenous folk patterns are categorized here as traditional patterns, which are part and parcel of rural society and culture. Both categories of games are played side

by side. Following table shows the classification of games as found during investigation in the rural areas of North 24 — Parganas.

TABLE

Category	Indoor	Outdoor
Indigenous Folk Games (Traditional)	Daba (Chess), Chor-Dakat (Thief and Decoit), RoshKosh (Juice and Extract), Guti (Small Stone pieces), Shologuti or Bagh-bandi (Sixteen stone pieces or Tiger in trap), Milano Khela (Matching game), Ikir Mikir (Finguring game with rhyme).	Guli (Marble), Gadhi (Court game), Fultola or Burlibasanti (Flower collection or Old woman in sitting), Hadodo or Kabaddi (Court game), Danguli (game with tree branch), Lal-it (Red brick), Luko churi (Stealing handkerchief), Mangsha Churi (Stealing meat), Kana Machi (Blind man's buff), Kumir-kumir (Crocodile game), Kit kit (Court game with flat pieces of tiles), Golia pak (Circular running), Upantibasko (Open tea box), Iching Biching (Jumping game with couplets), Lengri (One legged hopping), Talachabi (Lock and key), Tash and ticket (game with cigarette packets and Bus tickets), Elating Belating (Riddle game), Bequick (Rhyming with question-answer), Joga-re-Joga (Game with tree climbing), Prittu-prittu (Game with rubber ball and pieces of tiles).
Borrowed Games	Carrom, Ludo, Chinese Checker	Football, Cricket (with rubber or tennis ball), Volley ball.

To bring out the nature of those Folk games given in the table a few patterns are stated below briefly

INDIGENOUS GAMES (INDOOR)

Daba (Chess) : Males of age group 25-30 years prefer it. This is now an international game. Indian style is followed in the rural areas.

Chor-dakat (Thief - Decoit) : Children and boys of age group 16-25 years play this game in batches. Requirement is white papers of square shape. On each paper points are written such as *Chor* 50 (thief - 50 points), *Dakat* 60 (Decoit - 60 points), *Raja* 80 (King - 80 points) and *Police* 70 (Police 70 points) either in ink or pencil. The written pieces are folded and placed before any one of the players to be picked up and every body has to collect one piece and open secretly to find his position as any of the above character. Then the question of identification comes. If the policeman can identify the thief or decoit correctly, then he scores 70 points as a policeman. But in case he fails the *Chor* and the *Dakat* get their individual points. Points scored are determined as per the points recorded on square sheet as stated earlier.

Rosh-Kosh (Juice and Extract) : Boys of age group 10-16 years and below are found to

play this game in batches of five . Each player is named as *Rosh, Kosh, Singara, Bulbuli* and *Mastak*. All the participants place their fingers of right hand either spreading all the five fingers or concealing/folding any finger under the palm. In the process of placing the fingers they shake the hand as if trying to conceal from others their fingers at the same time they utter " *Rosh, Kosh, Singara Bulbuli and Mastak*". The number of fingers for each individual is counted. After counting the total number of fingers, the Chor (thief) is determined or selected. The Chor then places his right hand in front of others in a vertical position. The other players try to strike his hand with their right and left hand alternately. The Chor always tries to take off his hand to falsify other players' striking. If other players fail to hit the vertical hand of the Chor, the turn of the game is over, and the game is started afresh.

Guti (Small stone balls) : Children of age group of 16-20 years and below prefer this game. Generally two processes like *Char guti* (4 balls) and *Panch guti* (five balls) are followed. So four or five stone chips or broken pieces of bricks are needed as requisites. In the *Char guti* process the player throws four guti on the ground so that the guties do not spread far then a guti is picked up from the ground and thrown up in the air at a short height and before he/she catches it back the player collects the spread-out gutis from the ground. Thus one turn of player is over. In the next *dan* (chance), the number of gutis to be played which will be reduced to three and the player repeats the same process of spreading and collecting while the guti from the air is caught back. In case of failure in the sequence next player gets the chance. In the *Panch guti* game, the first *dan* or chance is similar, but in the fifth *dan* of the five guti game all the five gutis are thrown in the air and caught back. This process in the last is known as *saper fonos* (hood of snake). The sixth and seventh chances of five guti game are more complicated and locally known as *ghunte kurano* (cowdung cake collection). These games are preferred by girls of age group of 10-16 years than that of boys.

Sholo guti or Bagbandi (16 balls or Tiger in trap) : The game is popular among the children of the age group 10-16-years and youths ranging upto 25 years. Rainy season is the best time for this game among the village folk. A particular diagram is drawn on the even surface of varandah of a house or temple or school building. Two kinds of gutis numbering 16 +16 are needed. Generally small chips of red brick or black stone or big or small sticks are taken to play this game. In any case sixteen gutis on one side are so taken as to identify separately from other sixteen. A player on one side defeats his opponent on the other by a process of elimination on the diagram in a particular method of movement. The elimination process is by leaping over by one guti of a player on the opponent if a gap in the movement is found on the diagram.

BORROWED PATTERN (INDOOR)

Carrom : Apart from the conventional carrom game the children of different age groups and the youths play a different game called *Talgach* (palm tree). In this all the gutis (Carrom-men or coins) are arranged vertically one upon another at the centre of the board, which is named *Talgach*. Players try to drop the lowest guti of the vertical arrangement by hitting with the striker. The white, black and the red coin carry different points, obviously 5, 10, 50 respectively. The score is determined on the basis of these points and the number of coin dropped by each in the pocket. The highest number of points thus achieved is the winner.

INDIGENOUS GAMES (OUTDOOR) :

Guli (Marble) : Boys of different age groups like this game. There are five different types of games like (i) *Chala or gorano*, (ii) *Dewaltokka*, (iii) *Pil bighot*, (iv) *Gaipar or Gai-guch* and (v) *Aantpil* played with *guli* (marble). In the first category *Chala or Gorano* a small hole approximately 6 Cm. x 3 Cm. in depth is made on the selected area. This small hole is known as *pil*. The players move their *guli* towards the *pil* the *guli* are to cross the line drawn in front of the *pil*, facing the players. Then other players indicate a specific *guli* to give a *dan*, that means except that specific one any other *guli* can be struck. If the player is able to do it clearly he gets all the *guli* spread or thrown in the game. In the *Dewal tokka* the place is selected taking a wall as background. Just below that wall a square figure is drawn on the earth. All *guli* are to be dropped inside the square. The wall acts as a support so that the *guli* can be aimed at that square. The next type of the game is similar to that of *Gorano type*. In the *Pil-bighot* game, the *pil* is the main thing for consideration. In the *pil*, *guli* are moved from the particular place by each player whoever gives the *chal* keeping the *guli* within distance of one *bighot* (the distance covered by thumb and middle finger when stretched) from the *pil*, he gets all the *guli*. In the *Gaipar or Gai-guch* game a square court is drawn first on the earth. All *guli* given by the players are kept in the court. The particular *guli* just in the middle of the court is known as '*Gai*'. Everyone makes a target to strike the *Gai* to take it out of the court to win all the other *guli*. In case of *Aantpil* players throw their *guli* from respective places towards the *pil*. Whoever can place his *guli* nearest to the *pil*, gets the first chance to hit the other. It is notable here that all the principles of game are those of *Jityal* or *Mityal*. In the former marble won in the game are taken as reward forever and in the latter method the *guli* won are redistributed among the participants.

Gadhi (Crossing the court): Boys of age group (10-16) years and even upto 25, like this game and the girls within their teens like to play this game. A particular court is drawn on the open ground. Two parties or teams are formed with five or six players on each side accordingly as the court can accommodate. The players of one team stand in their respective zones in the court and the opponents in front of them outside the court and they try to go across the court towards the *Gadhi* zone. They try to out manoeuvre the opposing players in the court. If one player is able to return to the earlier position, having crossed the *gadhi* zone, it fulfils a game for the team. Sometimes the games are much contested.

Fultola or Burlbasanti (flower collection or Old woman in sitting) : Boys and girls prefer this game, generally within their teens. At first two teams are formed with five or six players on each side. Then one individual is selected *Ful* (flower) or *Buri* (Old woman) to make two teams. They settle within themselves, how many times would the *buri*'s team come home. Any open place or ground is used for playing the game. At the beginning one player from *buri*'s team uttering '*kit-kit*' chases the opposite player in order to touch any of them in one breath. If the player chasing loses his/her breath rhythm '*Kit-kit*' and the opposing player touches him/her, the player is knocked out of the game. In this process the *buri* or *ful* always tries to take the opportunity to return home without being touched or *Choa*.

Gollapak or Gollachut (Circular running) : An open space is selected for the game. Each team consists of five or six players. A circle is drawn on the ground to accommodate one player so that his/her leg can be kept inside fixedly within this circle. Then all the other players hand in

hand form a chain. The other party players spread haphazardly beyond the reach of the chain. The chained party rotate around the pivot keeping the root player inside the *golla* (circle). The player who is at the top end of the chain always tries to touch the opposing players in course of rotation. If the chain is per chance broken and the players are touched by the opponents, such players become *mor* (out). On the other hand if the chain is unbroken but able to touch (*mor*) the players of the opposite team they become *mor*. The players of the broken chain can however save their position by returning to the circle by step jumps before being touched by any opponent.

Kabaddi and Kho-kho : These two games are now played as international games with framed rules. But at the folk game levels these games are played on the basis of age-old practices in the village.

Iching-Biching (Jumping game) This game is mainly liked by small girls. Two teams are formed and the team-mates select which team will take the first chance of the game. The two players of the loosing team sit on the ground face to face stretching their legs apart. Then the players are to jump over the legs of the sitting players. In the course of jumping by the players, the sitting players next keep both their hands on their feet in order to raise the height. The players again jump over the sitting players in the similar way. The sitting players try to touch the frock or pant of the jumpers. In case, the jumping team fails to cross the height of the sitting players, they become disqualified. In case of successful jumping, next stage of the game is followed. In the next stage, the sitting players again keep their legs apart in a manner to spread the area of crossing. The jumping players jump twice on the leg forward and backward. It is repeated six times. In the process they tell a short rhyme like "*Iching biching chiching cha*" - "*Projapati ureja*" (the Butterfly is requested to fly away).

Danguli or Dandaguli (Game with twigs) : Here a *dang* and *guli* or *koli* are the main equipment. *Dang* is a wooden rod like stick made from a tree branch. *Guli* or *Koli* is a small part of similar branch and is about one third of the *dang* (about 30 Cms.). A small pit is drawn on the ground known as *pil* as a starting point. At first, the *guli* or *koli* is kept on the *pil* and then the player hits it with the *dang* at the end of the *guli*. When the *guli* is up in the air, it is hit with the *dang* to send it far away. This game is played on the basis of agreed points like 1000 or 2000 points measured with the help of the *dang* between the far end of the *guli* sent and the *pil*. When one player of the team takes the first chance to hit the *guli* with the *dang*, the opposite players try to *resist* or catch the *guli* in order not to allow it go far. If, by chance the *guli* is caught in the air by the opponents, the player is out of the game. Again, when *guli* is resisted on the ground the players try to hit the *dang* with *guli*. If the *guli* thrown hit the *dang*, the player will be out of the game.

Kit-kit (Hopping-a-breath) : Generally the girls of age group (10-16) years prefer to play it. They mostly play kit-kit followed by six court preferably. A court of particular shape is cut out on the ground. small pieces of broken tiles are used here as *guti* (preferred for flatness). Each player plays with respective *guti* by hopping left leg and has to cross the court jumping in one to the other. If during jumping, foot falls on the border line of the court, the chance is over. The player becomes *pancha* i.e. decomposed. Then other players repeat it. When they complete all the courts by placing *guti* each, then they go in similar fashion without *guti* by uttering "Kit-kit" at a single breath and return.

Kumir-kumir (Crocodile game) : In this game one is selected as *Kumir* (Crocodile). The *Kumir* sits within a circle drawn on the ground which is an imaginary water area (*Ja*). Other players place their hands on the head of the *Kumir* and move around him/her clockwise telling a rhyme "*Eka bajlo akhono kumir elo na*" (It is One'O clock, yet the crocodile did not arrive), etc. Uttering rhyme the moving players move away higher areas like tree branches *varandah*, heap of brick or sand, etc., thinking that they have gone upland or *danga*, quickly. The *Kumir* moves within his/her zone of water and always tries to touch and *mor* (Knock out) the others.

Rumal Churl (Stealing the hand-ker-chief) : At first the *chcr* (thief) is selected. Other players sit on the ground in a circle. The thief with a hand-ker-chief runs circling sitting players. The runner always tries to keep the hand-ker-chief secretly behind any of the sitting players. Placing the hand-ker-chief behind a player he/she pretends to keep on running. In case the thief can complete to hit on the back of the sitting player behind whom the hand-ker-chief was placed secretly. Then the thief takes the place of the sitting player who for the next chance runs circling behind the others and repeats the game. It is a very popular game among the village children.

While doing day to day work the village players practice their own folk games as mentioned above, which are a part of their way of life. Those games keep them fresh and give them joy because most of them are recreational in nature. They are passed from child to child in almost pure oral tradition with no reference whatever to print and probably with negligible influence from teachers, parents or recreation leaders. Thus these are passed over traditionally. No rules laid down on the pages of books, but they are oral changing from region to region, from village to village. Rules are, of course, flexible. The material or equipment used is, generally, local or as available in their huts or from the surroundings.

BORROWED GAMES (OUTDOOR)

Football : Gradually football is becoming a popular game in the rural areas. The rural boys prefer it much to play in the rainy season in muddy ground. It is played in short space as most lands are cultivated. The boys and youths play in bare foot in their local dress. They can not bear the cost of boot, hose, jersey, etc. Even the cross-bar is replaced by a string. But the rules of the game are followed. Recently a few players of rural areas are coming to join in the urban football clubs.

Cricket : The rural boys play cricket in winter season mainly in the month of October to early part of March. They make a pitch in the middle of the ground, with particular measurement. The modern rules and regulations are also followed as far as possible. They use tennis ball during play and also arrange friendly matches and tournaments in the local area.

Volley Ball : The rural boys and youths make the volley ball court and hang a net between two halves of the court and play. The friendly matches are played with much contest. In most of the cases modern rules and regulations are not followed.

III URBAN PATTERN

The urban areas are generally centres of modern games and sports. The typical feature of urban games both indoor and outdoor is that all these are generally club-oriented i.e., the clubs arrange games like Football, Cricket, Volleyball, Badminton, Carrom, Chess, Cards etc. for the club members as well as club players and for local competitions. The different game clubs are often under the large association which is also affiliated to Government recognized associations or under the supreme autonomous associations.

The local boys play individual games like cards, chess, etc. in the local club house. Almost every club possesses its own play ground where all outdoor games are played. The clubs, which are Government registered take part in both league and knockout tournaments. The more outstanding players of urban areas of North 24-Parganas play in Calcutta Leagues and Knockout Tournaments for different clubs of Calcutta. The other distinguishing feature of urban games is that these are almost played with modern up-to-date equipment and international rules. In most cases, the senior players of the club take initiative to train the players. Very recently few clubs have started football coaching centres for junior players. Therefore, due to better economic condition and developed system of communication, institutionalized modern games are organized with up to date equipment and management. Through training and tournaments the urban sports are well linked with city. The competitions and rivalries are part of the present day urban games. Evidences of quarrel, violence, supporter unrest after matches are of regular occurrences. The social roles of clubs and player are also notable. Many clubs and players donate money in Chief Minister's flood and draught aid-fund. Besides players and other game related personalities often engage themselves in donating medical aids to needy people, antidrug campaigning etc. The economic aspects reveal when we see that the players and other game related personalities earn money through it. The boom in games spectatorship has spent on the increase of leisure time for the mass. The present sophistication in game activities depend mostly on the sponsorships of business companies and hence is going to be totally a professional activity.

IV

It has been observed that in the rural areas indigenous folk games are yet existing where child to youth of both sexes participate. Such games need no equipment. They are just past time without any tension or rivalry. The techniques particularly the rhymes, couplets etc. associated with the folk patterns of games express many cognitive aspects of the folk elements of Bengali culture which are fast changing due to rapid urbanization. The borrowed modern games are less played in the rural areas though such games getting popularity day by day mainly among the school going boys and youths. In rural areas yet such games are played with local modifications in terms of their rules, dress, equipment and also management. This is due to their economic inability and also certain environmental factors. Some of the borrowed games have been parochialized and at the same time some of the folk patterns i.e. Kabadi, Kho-Kho, etc. have become universalised in recent times.

Thus, relatively informal, unorganized uninstitutionalized and participant oriented rural pastimes tend to become organized, institutionalized, commercialized and highly specialized forms of mass communication in the urban spots as well as in the city. The urbanization and industrialization have proved of paramount importance in changing the nature, extent and forms of games in West Bengal. Urbanization serving the goals of modernization brought new structural changes and innovations in the spheres of games. The mode and pattern of social interaction in games, which could have been proved more in urban spots than in the rural spots of West Bengal. Further, it affected greater physical proximity with more opportunities and maximum choice-making in games.

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Mousteroid Variants in India

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Abstract : Middle Palaeolithic is a specific chrono-cultural unit. In Europe the culture of this period is known as Mousterian which has a number of facies. These industrial forms are characterized by the specific genesis and the area of coverage. In the present paper attempts have been made to identify the variants of Mousteroid industries of India. The variance which have been identified are Mousteroid of Acheulian tradition, Mousteroid of Levallois base, Denticulate Mousteroid and Mousteroid with intrusive Flake-Blade technical features. The basic formulation of such variants have been made on the basis of technical features and the genesis thereof.

INTRODUCTION

Indian prehistory is provided with its own identity in terms of varied contents with the inclusion of typology of stone tools, fabrication technology, selection of suitable raw material, assemblage pattern and to some extent the geochronological succession. In addition to the same the Pleistocene history of India, initiated by De Terra and Paterson (1939) has already made significant progress. In recent times, besides the geological succession, geomorphological actions, sedimentological studies and both macro and micro fossil flora and fauna have given rise to new dimensions, both on chronology and palaeo-environment. In the same system with the coordination of palaeoenvironment and palaeoculture, especially of the Palaeolithic period, palaeoecology may be brought about. This particular area of research has recently been initiated (Ghosh et al 1993). In the same scheme suggestions have been put forward with regard to the makers of the Palaeolithic cultures and generalised distinctions of the groups based on regional locations and cultural attributes. Despite such slow progress some of the basic tenets of prehistory are still left aside. There are a number of problem oriented topics which require immediate attention. In the present disquisition one such topical area has been attempted to emphasise.

In major parts of the Old World the chronocultural succession has been given proper importance. In such cases there are two sets of parameters. One deals with the cultural traits covering the microattributes related to form of raw material, typology and technology. The other set deals with chronology, either directly or indirectly. The direct approach is concerned with absolute method (whenever suitable samples are available), geostatigraphy and its connection with cultural succession etc. The indirect approach for the determination of chronology, at least in related terms may be brought forth from the association of tool types, computation of incidence of different types in terms of percentage, spatial coverage etc.

SCHEME OF CLASSIFICATION

The discussion of Palaeolithic culture was formerly followed according to European scheme, even from the initiation of prehistoric studies made by Robert Bruce Foote (1866). Much later a

different proposal was made by Burkitt and Cammiade (1930). The tools from Kurnool area were divided into four series I - IV on the basis of typological features and technological peculiarities. Such suggestion was made primarily due to paucity of information on stratigraphy. The same concept was later followed by Sankalia (1956) with emphasis on broad typological features. In the same scheme minimum attention was not given on overall chronology. As a matter of fact it turned to be a product of over simplification. During the second half of this century emphasis was laid on the chronological nomenclature. A good deal of exercise was carried out on the Stone Age culture sequence of Africa. The same wave diffused in different directions and Subba Rao (1958) was influenced as evident from his proclamation of Early, Middle and Late Stone Ages. The same concept was further followed by a number of workers (Allchin, 1959; Mohapatra, 1962; Misra, 1967). It is hard to explain why no one made any critical assessment of Subba Rao's hypothetical model transplanted from Africa to India. On the other hand some amount of contradictions came into being, without paying any notice for modification (Misra, 1962).

The concept of terminology did not cease rather continued with the corroboration of available data and their indepth analysis. Scholars like Isaac (1960) coined new terminology, as "flake-blade industries" perhaps without full confidence. In spite of the fact this new thought process must have made impact to the contemporary workers. The present author has made continuous efforts to explain the terminology in meaningful terms and useful forms. The emergence of idea for labelling a culture or industry on the basis of form of raw material made a break through in the conventional framework (Ghosh, 1966). Through time the forenoted idea was further modified (Ghosh, 1970).

In comprehensive but brief form it may be said that for the purpose of parity the divisible units are to be identified of a definite broad spectrum of culture, Palaeolithic in the present case. The minimum divisible units are two, but between them an interphase can hardly be avoided. Such division into three units are not simple equal divisions. Rather, the specific markers for each unit are to be identified. Earlier typology, with the inclusion of technology had been taken as the prime constituents. But later it was resolved that in many cases one or more specific types are found to occur in different divisible units. Instances are not altogether absent indicating the extinction of a type in one particular unit and reappearance of the same after galloping the intermediate unit. The technological features appear to be more stable which continue following the path of progressive development. At the same time, it is difficult to discern the exact technological features. As a result technological characters cannot be given necessary weightage for the determination of chronocultural succession. Both types and techniques are direct cultural traits. Form of raw material has always been given due consideration as a formidable character. However the importance of the same has seldom been explored. With regard to form of raw material there are a number of discrete attributes. These are rock type, physical properties, chemical components, size variation, shape difference and above all the selection measure of most suitable pieces. At the same time, the form of raw material has a direct relation with the fabrication technology, e.g. from Cores and Cobbles (a better term than conventional pebble) are flaked out for manufacturing a tool. Later flakes are knocked off for making the tool. In furtherance the technology of detachment of flake was improved and the final product is an improved flake, specifically known as the blade.

STAGES BASED ON FORM OF RAW MATERIAL

Considering the above facts in the scheme of classification based on time spectrum, the form of raw material has been given the highest priority. In accordance with the above noted ideas, the total Palaeolithic culture, herein of India, has been divided into three successive units or elements, namely Cobble-Core element, Flake element and Flake-Blade element (Ghosh, 1969). In the first elemental stage, i.e. of Cobble-Core, tool types were fashioned either on cobble or on core and the flakes are the byproducts, mostly in the form of debitage. In the next stage, Flake element, the flakes detached were turned into tool types and the cobble and a-cobble cores were hardly of any use. The third and final stage of the Palaeolithic culture complex has two major entities. Blades form one of the components with higher technological development and the flakes continued as other component which are numerically dominant but recessive in the perspective of technological scheme. There is no basic distinction between flakes and blades, concerned with blank. This is confirmed from the fact that in many cases specific tool types were prepared both on flakes and blades. In reality, in this case there is a coexistence of both flakes and blades.

Each chronocultural element has its own characteristic features, comprising type of raw material, form of raw material, technology and typology. In case of Cobble-Core element, the material is mostly quartzite, and in places quartz, both cobble and core are the form of raw material, the technology includes free flaking, especially block-on-block and semi-controlled cylinder hammer technique. The major types are chopper, handaxe, cleaver and large number of scrapers of varied forms or subtypes. In case of flake element, some amount of replacement is observed on raw material with the inclusion of colloidal silica. Flake as the form of raw material predominates. Technology includes controlled technique which finally gave rise to Levallois. The major types are scrapers, small handaxes, points etc. The Flake-Blade element is dominated by colloidal silica; both flakes and blades are the forms of raw material; the technology of fabrication was with higher control in nature as punch. The major types are knife, scraper, burin, awl, point etc. In between two stages there are overlapping as between Lower and Middle, and Middle and Upper Palaeolithic cultures (White, 1982; Marks, 1990; Otte, 1990).

FLAKE ELEMENT — MOUSTEROID VARIANTS

It is necessary to note that in many areas within the Old World works have been carried out both on Middle Palaeolithic industries and their makers. In some sites only the Middle Palaeolithic industries have been discovered and in others only the fossils of *Homo sapiens neanderthalensis* have yielded. In some other sites both the fossils and the cultural remains have been found in association. A number of representative references have been presented here (Garrod and Bate, 1937; McCown and Keith, 1939; Movius, 1953; Schick and Stekelis, 1977; Shackley, 1980; Jelinek, 1982; Svoboda, 1988).

With a view to finding out the analogy between prehistoric and present day hunter-gatherers, different models have been developed and works have been reinforced accordingly. With regard to the Mousterian hominids and others which are ethnographically known as hunter-gatherers, the view point of Trinkaus (1991) requires to be pointed out. He puts forward the

query, "Can they (Mousterian hominids) be viewed merely as technologically simpler and less efficient versions of modern hunter-gatherers, or should they be seen as having had adaptive patterns that were qualitatively distinct?" (Trinkaus 1991 : 188). The resolution of this issue is difficult because of the complexities involved.

In Indian prehistory greater attention was paid to Lower Palaeolithic industries and next to this is on Upper Palaeolithic. Middle Palaeolithic or Mousterian or Flake element has seldom been considered as the specific problem. In fact the recognition of this stage was made much later. On the contrary, Mousterian industries have been properly undertaken for detailed study in European Palaeolithic culture complex. This industry has been categorised on the basis of distinctive tool types (Bordes, 1961) and probable functions (Binford and Binford, 1966). It is true that the functional implications cannot be always reliable due to dearth of appropriate evidences. However the typology and technology of Middle Palaeolithic or Mousterian culture have been examined and analysed by Bordes (1953, 1961, 1969). According to him, "Mousterian is not a specific industry but it is a composite and complex of industries" (Bordes, 1968: 98). He has identified a number of facies primarily based on typological assemblages and technological association in different geo-environmental regions. In case of India Paterson (1940) suggested that the Middle Palaeolithic is essentially a stage of flux.

On the relationship between Flake and Flake-Blade industries the linkage has already been established (Ghosh, 1969). In furtherance the Flake element was further discussed with the inclusion of denticulates (Ghosh, 1972). In recent times specific industries have been identified with the nomen Middle Palaeolithic or Mousterian or Flake element. The term Mousterian does not appear to be appropriate in India because in this country similar industries are showing a good deal of variations. However, Mousterian is typical while Mousteroid is variant. The Indian variants are to be termed as Indian Mousteroid.

Like Europe the variation is present in India but in more conspicuous form. On the basis of the occurrence of the typo-technological data it may be apprehended that instead of regional conformity of a specific facies of Mousteroid, different Mousteroid facies, primarily with their base on the genesis, are found in one region. In other words, the total Mousteroid facies in Indian subcontinent is an aggregate of different traditions namely, Mousteroid of Acheulian tradition, Mousteroid with Levallois base, Denticulate Mousteroid and Mousteroid with intrusive Flake-Blade technological features.

It is necessary to present a brief description of the above noted variants, pointing to the basic features and the elements of genesis. The samples incorporated here have been selected from different parts of India.

Mousteroid of Acheulian tradition — Acheulian in the perspective of technology went through a continuous progressive development throughout the phase of Cobble-Core element. At a later stage this technology was mingled with Levallois technique. The integrated production technology gave rise to a specific variety of Mousteroid in which the vestiges of Acheulian tradition are met with. These tools are relatively larger in size, both on major and minor axes. The typical morphology of handaxe is found to be retained (Fig. 1 and 2).

Mousteroid with Levallois base— Unlike the preceding variant in this case the Acheulian features are seldom present. on the other hand the basic preparation of core and detachment of the prepared tool is the special feature of this variant In this case the tools are invariably provided with the midrib and the flakes are lenticular in shape (Fig. 3 and 4).

Denticulate Mousteroid— The conspicuous character among the tools of this variant is the presence of denticulated margin as a result of detachment of small tertiary flakes giving rise to a nibbled morphic forms. These tools are appreciably smaller in size, and the breadth is comparatively large (Fig. 5 and 6).

Mousteroid with intrusive Flake-Blade technical features— In perfect reality, blade in fullfledged form emerged during Flake-Blade element. The blanks are typical blades due to application of blade technology. It is obvious that prior to fullfledged form, the nascent blades came into existence a little earlier. In the overall scheme of technology better workmanship is found among some tool types which are produced on blade-like flakes. These pieces indicate the technology tending towards blade; and at the same time the basic structure in production technology manifests the character of Mousteroid tradition. Invariably these tools are elongated and the relative breadth is smaller (Fig. 7 and 8).

Here instead of typological nomenclature, emphasis has been laid on production technology with special emphasis on Mousteroid tradition. Most of the tool types of all the Mousteroid variants under consideration are scraper. In addition to the same, other types, namely points, knives etc. are not altogether absent.

In dealing with the variants of Mousteroid techno-typological tradition in India, the major issues are to be explored. It is obvious that the Palaeolithic culture complex of India is not uniform, rather there are distinctions. The differences may be accounted for in terms of the greater spatial magnitude of the area, environmental dissimilarities and differences in natural resource potentials. Under such condition the hominid groups of late Cobble-Core element and early Flake element used to live in physical isolation. The cultural outfits were prepared on the basis of prevailing needs and availability of resources. As a matter of fact, in the same wide cultural pool, there were entities of distinct groups, may be termed as variants. Through time there was continuous increase of population and so also decrease of natural resources. Under such circumstance the rigidity in territorial concept probably turned loose. This gave rise to inter-group connections which paved the way for exchange and assimilation of cultural traits, as of types, techniques and even functional implications.

For the above consideration the Mousteroid industries in India are found as variants, without geographical limitations. The most interesting feature of Mousteroid variants in India are the coexistence of a number of variants in different geocultural regions. Such system practically favoured the sustenance mechanism with higher adaptation and greater coordination.

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Trend of Tribal Literacy in West Bengal

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Abstract During the last four decades level of literacy among the scheduled tribes has been rapidly increasing from 6.5 per cent in 1961 to 27.8 per cent in 1991 with a speed of literacy of 110 per cent during 1981-91. There is a gap between the sexes with regard to the rate of literacy of 24.3 per cent. Further phenomenal change of rate and speed of literacy can be detected during the period of 1991-93. Generation wise change in the rate of literacy can also be noticed among the Oraons of Midnapore town. Rural urban differentials are existing in the case of tribal literacy.

Key words Level of literacy, speed of literacy, scheduled tribes, sex differentials, rural urban differentials, inter tribal communities, generation differentials

INTRODUCTION

Level of literacy can be considered as a parameter to ascertain the educational status of a community. Policy on education both in the State and national levels gives top priority on literacy programme. United Nation had declared 1990 as the International Literacy Year. Rate of literacy even in 1991 is low e.g. 52.21 per cent. It is the lowest among the scheduled tribes i.e. 29.6 per cent. as per 1991 census. The scheduled tribes are the weakest section of Indian Society as evident even from level of literacy. The literacy rate among the scheduled caste is 7.8 per cent higher (i.e. 37.4 per cent for scheduled castes) than that of the scheduled tribes. As a matter of fact, the development programme for scheduled tribes could not reach the target point as the literacy is one of the most powerful agent for social development as well as modernization.

Lerner (1962 : 61) has rightly pointed out that literacy is both the index and agent of modernization. It is equally true that illiterate society can neither be in the forefront of technological creativity nor can use new technologies (Gill 1966 : 18). It is an undenyng fact that there exists an integral relationship between literacy and socio-economic development. The main intention of the study is to examine trend of literacy of the scheduled tribes of West Bengal during the period of 1961-91. An analytical study on tribal literacy in one of the backward areas of the State, namely, Jhargram and Midnapore Sadar subdivisions has also been attempted. Finally, generationwise variation of level of literacy has been presented with a view to understanding implementation of eradication of illiteracy programme in a particular locality.

Literacy among the scheduled tribes was very low in 1961. Table -01 gives variation of the per cent of tribal population to total population of the State as well as trend of rate of literacy of the scheduled tribes of West Bengal during the period of 1961-91. In 1961 level of literacy was 6.5 per cent and the figure raises to 39.6 per cent in 1991. In all-India context tribal literacy is 29.60 per cent in 1991 (Table - 02).

Tables 02 and 03 give a comparative account of level of literacy during 1981 and 1991. It reveals from Table 02 that rate of literacy among the male members of scheduled tribes for both the State and all-India is more or less same. Table 03 shows that difference between the State and all India levels is coming down from 3.14 points in 1981 to 1.82 points in 1991.

During the last few years the State Government has been launching mass programme for eradication of literacy but the result has not been adequately reflected in the census report of 1991 owing to various reasons.

II

LEVEL OF LITERACY : WEST BENGAL

Level of literacy is one of the major variables to identify status of development of any community. Level of literacy can be measured by the percentage of total population of a particular community found to be literate. Socio-economic and quality of life of the scheduled tribes of West Bengal can be understood in terms of the level of literacy attained by this people. It appears from the Table - 04 that during 1961-71 the level of literacy of the scheduled tribes of West Bengal was very low e.g. 6.5 per cent and 8.9 per cent respectively. There was significant improvement of literacy rate from 1971 to 1981 when the level reached 13.2 per cent. But remarkable change occurred between 1988-1991. From 19.9 per cent in 1988 the figure very significantly raised to 27.8 per cent.

SPEED OF LITERACY

Speed of literacy is a measure in terms of the percentage change in the rate of literacy between two points of time. This measure is very useful to understand the trend of literacy. During 1961-71 speed of literacy of the scheduled tribes of West Bengal was 37 per cent. But the acceleration of literacy can be easily understood when it reached 51 per cent during the period of 1971-81 and 110.6 per cent in 1981-91. Such phenomenal change of literacy rates from 13.2 to 27.8 can be easily comprehended when literacy speed jumps to 110.6 per cent in 1991 (Table - 04).

It appears from the above Table - 05 that the literacy level of scheduled tribe women is very poor. It was only about 02 per cent in 1961 which gradually increased to 03 per cent in 1971 and 05 per cent in 1981. Discrepancy between male and female scheduled tribes of West Bengal can be easily apprehended from column 03 of the said table. It can be readily ascertained from the table that though overall level of literacy has been increasing but at the same time differences between the sexes have also been increasing. In 1961 gap between the sexes was 9.4 point which ultimately reached 21 points in 1988. Such increasing discrepancy between the sexes points out that the notion of 'high status of women in tribal society' is not very correct. Rather a comparative study on the rate of literacy between the sexes negates the equal status of women in tribal society, at least for the present situation. However, the level of literacy for the scheduled tribe women is 09.5 in 1988 which is considerably low. A recent survey conducted during 1993-94 shows that the rate of literacy for tribal women even in backward region of South Bengal has considerably increased.

SEX DIFFERENTIALS AND LITERACY

The data on sex differentials in literacy of scheduled tribes demonstrate that male members are always forward in matters of attainment of education. The male literacy rate increased from 11.2 per cent to 14.5 per cent during 1961-71 and 14.5 per cent to 21.6 per cent during the period of 1971-81. It has been increased to 30.2 per cent in 1988. In a recent survey conducted among the scheduled tribes of South Bengal the figure is further increased. The speed of literacy among the male scheduled tribes is 29.7 per cent during 1961-71, 49 per cent during 1971-81 and 41 per cent during 1981-88. Though female members of the scheduled tribes are less interested or motivated in the matter of attainment of education as compared to the male members, the

speed of literacy for the female members is considerably of higher order than that of the male members. The order of increasing status of literacy among the female members can be readily apprehended from the Table 05. The speed of literacy among the female during 1961-71 is 72.2 against the corresponding figure for male which is 29.7 per cent. During the period of 1971-81, the speed of literacy for the female is 61.3 per cent against 49.0 per cent for the males. The female members attain the highest speed during 1981-88 having 90.0 per cent and the male members speed of literacy slow down from 49.0 per cent during 1971-81 to 41.0 per cent during 1981-88. In fact when the female member's speed of literacy increases by 29 points (from 61.3 per cent to 90.0 per cent) during 1971-81 and 1981-88, the corresponding figures for male decreases by 8 points from 49 per cent to 41 per cent. Therefore, it appears that though level of literacy among the female members is low, the educational status of female is improving more rapidly as compared to males which can be demonstrated on the basis of comparative study on the speed of literacy between the sexes.

III

LITERACY DURING 1993 : SELECTED TRIBAL COMMUNITIES OF SOUTH BENGAL

A sample of 2532 scheduled tribe population from Midnapore Sadar, Jhargram subdivisions, backward region of the State and also the district, has been selected to study the level of literacy among the weakest section, scheduled tribes, of the State. (Table - 06). The multistage stratified sampling design covers seven localities of which three localities are situated in the urban environs of Midnapur town, two in rural-urban zone and two in remote rural region of the district. Two matching samples have also been considered of which one is near a famous tourist spot of Bankura, Mukutmanipur, and other near Barrackpore, subdivisional headquarter of 24 Parganas (now North 24 -Parganas)*.

LEVEL OF LITERACY AMONG THE SELECTED SCHEDULED TRIBES OF SOUTH BENGAL

It appears from the Table -09 that six communities, Munda of Muradanga, Oraon of Tantigaria and Santal O Madhudincha, Godapiasal, Dhaboni and Kheria of Godapiasal fall below 40 percent rate of literacy level.

It is important to note that the Oraons of Tantigaria and the Mundas of Muradanga though live in urban set up of Midnapore town, the district head-quarter and very close to Vidyasagar University, they have low percentage only 26.6% and 23.3% respectively. The Kherias of Godapiasal and of Mukutmanipur show significant difference of about 15 point in the level of literacy. However, the Oraon of Dangadighla 3 km. away from Barrackpore, subdivisional

*. Dhaboni is a uniethnic tribal village which is situated in Ballgeria block of Nayagram police station in Jargram subdivision of Midnapore, West Bengal. The village is located far away from urban centre in remote region near the border of West Bengal and Orissa. The people are solely dependent on cultivation. It is a typical Santal village the total population is 295 with 48 per cent male and 52 per cent female. Madhubainch is a mixed village where Santal and caste Hindu live in separate hamlets. Out of total 70 households Santals have 20 households. It is situated in Datan police station of Midnapur Sadar subdivision. The village is in rural set up and the people are solely dependent on cultivation. The village is located near Bengal-Orissa border. Jhantibandh is a multiethnic village situated in Manikpara police station of Jhargram subdivision in rural-urban set up. There are 38 families of which 25 are Santals and 8 Mahals. Rest are scheduled caste population, Harijs. The people are completely dependent on cultivation. Godapiasal is a multiethnic village in rural set up but getting some rururban socio-economic characteristics. The village is well connected with Midnapore town by train and bus routes. The Santals are workers, gangman of railway and Kheria are both cultivators as well as work in secondary and tertiary sectors.

headquarter of North 24 Parganas score the highest point as the rate of literacy is 63 per cent. It appears that position of tribal people of Midnapore, as a whole is considerably lower than that of the tribals of Bankura and North 24 Parganas so far level of literacy is concerned. Only three communities Bhumij of Bagdubi (42%), Santal and Mahali of Jhantibandi (51.7 and 52.6%) score more than 40 per cent level of literacy whereas two selected communities Kheria of Mukutmanipur (54.7%) and Oraon of Dangadighla (63%) score considerably higher percentage in level of literacy. Table-10 reveals gap between sexes among the scheduled tribes with respect to literacy. The gap between sexes is the highest about 40 percent among the Kherias living in a traditional set up. It is also lowest among the said community but those Kherias who have been rehabilitated in a model colony at Mukutmanipur have higher literacy rate. The gap is also considerably high among the Mahalis. The Santals reflect some different characteristics as the gap varies between 31 per cent to 17 per cent (see Table - 10). The estimated literacy rate among six tribal communities living in ten villages is 34.2 per cent whereas the rates of literacy of two communities each from Bankura and North 24 Parganas are 60% and 72.3% respectively. If we consider literacy rate of scheduled tribe people of eleven selected villages as a whole the figure is 39.4 which is one point below the average rate of literacy for scheduled tribes of West Bengal. This may happen due to the fact that the sample is mainly drawn from the backward region of Midnapore district. This study points out the need for an elaborate plan for spread of literacy programme where emphasis should be given to the tribal people.

LEVEL OF LITERACY IN URBAN, RURBAN AND RURAL SETTINGS

It is well known fact that the rate of literacy varies between rural and urban area. But our data do not support this view as Munda and Oraon living in urban area have low literacy rate (24.3% and 27.6%), whereas Bhumij living in the same region scores considerably high e.g. about 55 per cent (Table - 12). Therefore, other than rural and urban differential factors are existing for such gap of the level of literacy between the communities which is estimated as more than 27 per cent.

The Santal communities of different villages show some interesting features. The Santals living in remote village e.g. Dhaboni the rate is considerably low compare to those living in rururban setting e.g. village Jhantibandh. There is a gap of 18 per cent among the Santals living in two different set up. The Kherias of Mukutmanipur who are living in rehabilitation colony shows higher rate of literacy 54.7 per cent than that of those live in Godapiasal having a rate of literacy of 39.3 per cent. Similarly the Oraons of Dangadighila near Barrackpore of North 24 Parganas have very high literacy rate 63 per cent than that of those live in an enclave of Midnapore town. Table II reveals that uniethnic tribal villages of three districts are quite different so far level of

Bagdubi is a multiethnic village situated about 5 km. away from Midnapore railway station in Tantigera anchal, Midnapur Kotwall police station. The people are mainly cultivators and agricultural labourer. Some people work as daily wage earners in poultry of Midnapore hatchery firm. Muradanga is a multiethnic village situated in the urban environs of Midnapore town where the Munda live along with other scheduled tribes and caste Hindu communities. The village is well connected with Midnapore town. The Mundas are daily wage earners and mostly engaged in non-agricultural occupation. Tantigera is a tribal enclave located in the Midnapur municipality and the Oraons of Tantigera are working in different mills and factories as daily wage earners. Dangadighila is a uniethnic village situated 3 Km. away from Barrackpore, a subdivisional headquarter of North 24 Parganas. It is well connected with Barrackpore and Calcutta. Mukutmanipur is a famous tourist spot in Bankura district which has been developed for Kangsabati reservoir and irrigation project. The Kherias have been rehabilitated here with a model colony. They are mainly cultivators and a few of them are engaged as Class -IV staff in the office of the Kangsabati project.

literacy is considered. Rate of literacy is 34 per cent in the case of Midnapore which is the lowest and that of North 24 Parganas having 63 percent is the highest. The position of the uniethnic village of Bankura having 55 per cent occupies the middle position. There are 29 point differences between Midnapore and North 24 Parganas, 21 point between Midnapur and Bankura and 8 point between Bankura and North 24 Parganas uniethnic tribal villages. The gap between sexes with respect of literacy is very high in Midnapore being 31 per cent, low in Bankura 11 per cent and considerably high in North 24 Parganas having 20 per cent.

IV

ERADICATION OF ILLITERACY PROGRAMME IN A TRIBAL ENCLAVE

Eradication of illiteracy programme is one of the major issue for improving of the quality of life as well as to motivate the people for social change. Both Government and non-Government agencies have been involved to implement the programme with all available resources to make the literacy mission programme a success. Tantigeria is such an enclave in ward no. 21 of Midnapore Municipality where literacy programme has been implemented under the supervision of the S. D. O of Midnapore and the Chairman of the Municipality; other responsible persons were involved to give the leadership of the programme. The mission of literacy programme was started in the first week of November 1990

In Tantigeria the social position of the Oraon is the lowest. An indepth study on the Oraon has been undertaken from this point of view with an aim to understanding how much the Oraons have been benefitted with such programme. Fifteen married male and fifteen married female members of the Oraon community of Tantigeria were selected for in depth study with genealogy. In depth study on level of literacy has been attempted with genealogical method so that spread of literacy could be detected through three generations i.e. ego's generation, first ascending generation of the ego and first descending generation of the ego. In the ascending generation only parents have been considered including deceased. In the ego and ego's descending generation, ego's children as well as who live in the same family have also been included.

Total number of member covered through genealogical method is 287 of which 53 per cent are male and 47 per cent female (Table - 13). Generation wise classification of the population reveals that 21 per cent belong to ego's ascending generation, 56 per cent to ego's own generation and the rest, 23 per cent to first descending generation. Table - 14 reveals that only one person of the sample belongs to first ascending generation was literate. In ego's generation level of literacy was 15.6 per cent and in first descending generation it increased to 34.3 per cent. In this context it should be mentioned that those children below 6 years were considered as illiterate. However the rate of literacy in descending generation in comparison to older generation is satisfactory and indicating social change.

Sex differentials of literacy can be noticed in three generations. In the ascending generation there is no female member who was a literate. In ego's generation 19 per cent male were literate and corresponding figure for female is 8 per cent. Therefore, a gap between sexes of 14.4 per cent can be marked. In the ascending generation gap between the sexes has been decreased from 14.4 per cent to 7.8 per cent in the descending generation. It reflects more children are participating in schooling programme. The speed of literacy from ascending generation to ego's

generation is extremely high 875 per cent because of the fact that the level of literacy is very negligible in ascending generation (Table -15). The speed between ego's and descending generation is comparatively less i.e. 120 per cent. Sex differentials in intergenerations with respect to literacy can also be noted in Table - 14. Both in first ascending and ego's generation there is no literate female members in Oraon communities of Tantigeria. Therefore speed of literacy shows distinct variation between the sexes in descending generation i.e. 68.8 per cent among the male and 275 per cent among the female members (Table -15). It also reflects very rapid involvement of the Oraon female members in literacy programme.

SUMMARY AND CONCLUSION

Level of literacy of the scheduled tribes for all India level is 1.8 per cent more than State level. In West Bengal level of literacy has been increased by 14.6 per cent during the same period from 13.21 to 27.8 with the speed of literacy of 110 per cent. Therefore, a rapid improvement of rate of literacy in case of the scheduled tribes or West Bengal can be readily ascertained. Decadal variation is sharp during 1971 and 1981 from 8.9 per cent to 13.2 per cent with 48 per cent speed of literacy. It becomes 39.6 per cent during the period of 1988-91. It is important to note that a gap between male and female with respect to rate of literacy is prominent both in the state and national levels. In national level gap between the sexes is 22.5 per cent and in the state level it is 25 per cent. It indicates less participation of female members of the scheduled tribes in schooling and other educational programmes. The gap between sexes with respect to rate of literacy is increasing from 2.0 in 1961-71 to 8.0 in 1981-91. But speed of literacy between the sexes is very significant as among the male members speed of literacy is 88 per cent during the period of 1981-91 whereas the figure is more than double i.e. 200 per cent among the female members. Therefore, it can be said that though literacy rate is low among the female, it has been rapidly increased because of the fact that they are more interested in education and improving more rapidly compare to the male members. Recent (1993) study on literacy among the scheduled tribes of the backward region of Midnapore district reveals that general literacy rate is little more than 34 per cent. In other village e.g. Dangadighela of North 24 Parganas the rate is as high as 62.9 per cent. Hence, there is a phenomenal change of rate of literacy between 1991 and 1993. Such a great change within two years is due to mass participation in mission of literacy programme initiated by the State Government. Level of literacy in three generations of the Oraons of Tantigeria shows very rapid improvement from generation to generation. The rate of literacy is 1.6 per cent in the first ascending generation and the figure increases by 14 points in the next generation i.e. ego's generation 15.6 per cent with a speed of 875 per cent. In the descending generation the rate of literacy is further improved to 34.9 per cent with a speed of 120 per cent. It is due to the fact that in ascending generation literacy was extremely low and the rate is increased in ego's generation considerably. Such condition of inter generation rates of literacy have been much reflected in the speed of literacy among the people, the Oraons of Tantigeria.

Table 01 *Distribution of per cent of scheduled tribal population, literacy rate and speed during 1961 - 91, West Bengal.*

years	Per cent of tribal population	Decadal variation	Literacy rate	Speed
1961	5.88	—	6.5	
1971	5.72	23.31	8.9	26.9
1981	5.63	21.23	13.2	48.3
1991	5.60	24.04	27.8	110.0

Table 02 *Level of Literacy 1991*

	General	Male	Female
West bengal	22.78	40.07	14.98
India	29.60	40.65	18.19

Table 03 *Level of literacy in scheduled tribes, 1981-91*

Year	W Bengal			India		
	General	Male	Female	General	Male	Female
1981	13.21	21.16	5.01	16.35	24.52	8.04
1991	27.78	40.07	14.98	29.60	40.65	18.19

Table 04 *Level and speed of literacy in scheduled tribes of West Bengal*

year	Level of literacy			Speed of literacy		
1961	06.5			36.9		
1971	08.9			48.3		
1981	13.2			50.8		
1988	19.9			103.5		
1991	27.78			110		

Table 05 *Level and speed of literacy in scheduled tribes (sex wise), W. Bengal*

Year	Level of literacy		Gap between sexes	Speed of literacy	
	Male	Female		Male	Female
1961	11.2	01.0	9.4		
1971	14.5	03.1	11.4	29.7	72.2
1981	21.6	05.0	16.6	49.0	61.3
1988	30.2	09.5	20.7	41.0	90.0
1991	40.07	15.0	24.3	88.0	200.0

Table 06 *Level of literacy among the scheduled tribes of Midnapore, W.Bengal during 1993*

Population		No of literates		Level		Gap between sexes
Male	Female	Male	Female	Male	Female	
1272	1260	572	281	44.97	22.30	22.67
Total	2532	861		34.01		

Table 07 *Level of literacy in scheduled tribes of two sample villages (matching samples)*

Villages	Population	No of literates	Level	Gap between the sexes
Dangadighela (North 24 Parganas)	466	293	62.9	20.2
Mukutmanipur (Bankura)	135	61	54.7	10.9
Total	601	354	58.9	20.3

Table 08 *Population and literacy rate among the sampled scheduled tribe communities*

Population			Literates			Gap between sexes
Total	Male	Female	Total	Male	Female	
3133	1587	1546	1215	788	427	
100	50.7	49.3	38.78	49.65	27.6	22.0

Table 09 *Level of literacy among the scheduled tribes (selected) of South Bengal*

Scheduled tribes	Population	Level of literacy
1. Muda of Muradanga	206	24.3
2. Oraon of Tantigeria	630	26.6
3. Santal of Madhubincha	86	29.1
4. Santal of Godapiasai	12	33.3
5. Santal of Dhaboni	295	39.3
6. Bhumij of Bagdubi	294	41.8
7. Santal of Jhantibandh	116	51.7
8. Mahals of Jhantibandh	38	52.6
9. Kharia of Mukutmanipur	135	56.7
10. Oraon of Dangadighela	466	62.9
Total	2884	39.4

Table 10 *Distribution of literacy sex wise in selected tribal communities of Midnapore*

Scheduled tribes		Male	Female	Gap between sexes
1	Kheria of Godapiasal	60.9	21.2	39.7
2	Mahali of Jhantibandh	70.0	33.3	36.7
3.	Santal of Dhaboni	50.0	19.0	31.0
4	Munda of Muradanga	35.6	12.8	22.8
5.	Santal of Madhubincha	38.6	16.2	22.6
6.	Bhumij of Bagdubi	52.4	31.5	20.9
7.	Santal of Jhantibandh	59.4	42.3	17.1

Table 11 *Level of literacy and gap between sexes in uniethnic tribal villages, S. Bengal*

Tribal village	Level of literacy			Gap between sexes
	Total	Male	female	
Santal of Dhaboni, Midnapore	33.9	50.0	19.0	31.0
Kheria of Mukutmanpur, Bankura	54.7	60.0	49.1	10.9
Oraon of Dangadighela, North 24 Parganas	62.9	72.3	52.1	20.2

Table 12 *Level of literacy in urban, rural and rural setup, Midnapore, W. Bengal*

Set up	Munda	Oraon	Santal	Mahalis	Kheria	Bhumij
Urban	24.3	27.6	—	—	—	54.7
Rurban	—	—	51.7 & 33.3	52.6	39.3	—
Rural	—	—	33.9 & 29.1	—	—	—

Table 13 *Distribution of population among the Oraons of Tantigera through generations*

Generations	Total		Male		Female	
G + 1	60	20.9	30	19.7	30	22.2
G = 0	160	55.8	85	55.9	75	55.6
G - 1	67	23.3	37	24.4	30	22.2
Total	287	100	152	100	135	100

Table 14 *Level of literacy through generations among the Oraons of Tantigera, Midnapore*

Generations	Total	Male	Female	Gap between sexes
G + 1	1.6	3.3	—	—
G = 0	15.6	22.4	8.0	14.4
G - 1	34.3	37.8	30.0	7.8
Total	17.0	22.4	11.3	11.1

Table 15 Speed of literacy among the Oraons of Tantigena, Midnapore

Generation	Rate of literacy			Speed of literacy		
	Total	Male	Female	Total	Male	Female
G + 1	16	3.3	—			
G = 0	156	22.4	8.8	875	578.8	—
G - 1	34.3	37.8	30.0	120	68.75	275

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Kinship and agricultural cooperation in a Santal village : a preliminary attempt at an ecological interpretation.

AJOY CHATTERJEE

ABHIJIT GUHA

Abstract Kinship is not only symbolic, it is also one of the most important organizing principles of human society which channels concrete productive activities, as for example, agriculture in tribal and peasant societies. Agricultural activities in any specific region again, operate under some climatic and technoeconomic constraints. The present case study of a Santal village in Midnapore, West Bengal, shows how even under the influence of a cash oriented market economy the Santals use kinship ties to carry out agriculture under a given set of technoenvironmental constraints.

THE PROBLEM

Napoleon Chagnon in his article *Anthropology and the Nature of Things* (1979) put forward a critique of the trend of increasing specialisation within anthropology and blames squarely the symbolic school for viewing kinship from a purely ideational standpoint. In Chagnon's words : ".....much of the lack of understanding, or even suspicion, that characterizes the relationship between biologically oriented and culturally oriented anthropologists is built into the discipline itself, a product of increasing specialisation and narrower and narrower focuses on smaller and smaller problems coupled with stronger and stronger convictions about the symbolic nature of kinship, marriage, and even reproduction itself," (Chagnon, 1979). In our opinion, Chagnon's claim about the dominance of the symbolic view of kinship in anthropology represents a partial truth. There are strong anthropological traditions of viewing kinship as a domain governed by economic, political and even ecological principles. (Godelier, 1977; Leach, 1961). Julian Steward's classical study of patrilineal and matrilineal band structure or Marshall Sahlins' analysis of Nuer segmentary lineage are cases in point. (Sahlins, 1961). The famous Worsely-Fortes debate on the nature of kinship among the Tallensi and its modern extension by Marxist anthropologist Maurice Bloch shows that kinship can also be viewed within the broader contexts of economy and ecology (Bloch, 1972, Sahlins, 1976). Basically, any human activity is social and in precapitalist social formations kinship relations play a major role in organising the productive tasks in a given society. The productive tasks in a society again have to operate within a (i) given range of climatic conditions, (ii) a given level of technology and (iii) a finite source of humanpower. In the present paper we will make an attempt to demonstrate how in a rural tribal society under a given set of climatic and technological conditions, humanpower is organised through kinship ties. For us, kinship is not only a symbolic phenomenon but it also organises the labour pool of a society in a particular set of ecological conditions

PRESENTATION OF THE DATA AND METHODOLOGY

In order to show how the utilisation of human labour in a tribal village is inseparably linked with kinship, we present our data from a Santal village in the Jhargram subdivision of the Midnapore district in West Bengal. The name of the village is Biridanga which is under the Block Binpur - II and is part of the mouza village Orgonda (J. L No. 234). Biridanga is 2 kms. away from Silda, a sub-urban market centre which connects the region with various urban centres within and outside the state.

The Santals of Biridanga are primarily engaged in agriculture and the main crop is paddy. They cultivate their lands for only one season i.e. from June-July to December. After this period, both the males and females go outside the village to work as day labourers at Silda; during the boro season they also migrate to the districts of Burdwan, Hooghly, Bankura or other districts to work as agricultural labourers. Some of the villagers are also service holders in government offices at Calcutta. But they have also been found to possess agricultural land in the village which are being cultivated by their kins and relatives.

The village has 351 individuals having a balanced sex-ratio with 72 households. The mean household size is 4.8, the range being 11. Through opportunity sampling, data on landholding of 41 households have been collected. The average landholding is 2.55 acres with a standard deviation of 1.82. The maximum amount of land occupied by a household is 10.14 acres and the minimum is only 0.42 acre. Out of these 72 households, 47 % (34) are nuclear while 25% (18) are extended type.

Agriculture in this village like many other villages in the region totally depends upon rain water. For this reason, they try to complete the agricultural operation as quickly as possible. Every Santal household possesses some amount of land and draught animals. But the landholding pattern, family type and household size of the village show that every household require cooperation and help from persons outside one's own household during the agricultural season and they do not also have the economic power to employ wage labourers. As a result, we find a lot of transactions among kins centering around various agricultural activities.

Data on agriculture have been collected on each household through census and open ended questionnaire schedules. But general information on kinship and agricultural cooperation among the households of the village have been collected after the end of paddy cultivation when many of the adult members of Biridanga have left the village as wage earners. For this reason, we took recourse to a kind of opportunity sampling and collected data on the relationship between kinship and agriculture from 41 households. And for the collection of specific quantitative information on the agricultural season which had just ended, 12 households (30 per cent of the 41 households) have been selected through stratified random sampling based on household size.

Now according to the availability of data, the nature of payment in agricultural operation of the 10 households (out of 12) have been presented in the following table :

TABLE — I
NATURE OF PAYMENT AND FREQUENCY OF TRANSACTIONS

Nature of payment	Frequency of transactions
Cash	30 (41.67)
Kind	14 (19.44)
Labour exchange	14 (19.44)
No return	14 (19.44)
Total	72 (99.99)

Figures in parentheses represent percentages.

The table clearly shows that although the village is situated within a fold of market forces, payment for the majority of agriculture related transactions (58%) are not made through cash and 19% of them do not require any return at all.

In another quantitative break-up we have tried to compute the frequency of economic transactions with different types of relatives for the 12 households of the village. The transactions include the various types of help and cooperation as regards (i) ploughing, (ii) transplantation and (iii) harvesting. The nature of kinship ties on the other hand has been classified by using a kind of etic grid which measures the degree of distance between ego and alter in terms of the number of connecting relatives. The table is presented below :

TABLE — II
FREQUENCY OF TRANSACTIONS WITH NUMBER OF CONNECTING RELATIVES

No. of connecting relatives	Frequency
0	9 (17.65)
1	19 (37.25)
2	7 (13.72)
3	5 (9.80)
4	6 (11.76)
5 -8	5 (9.80)
Total	51 (100.00)

Figures in parentheses represent percentages.

The table shows that our sampled households sought help most of the time from the relatives who are one and two degrees removed from the ego in the genealogy.

INTERPRETATION

The foregoing presentation of the data from a Santal village on kinship and agricultural activities can be put in a wider framework of man-environment interaction. Kinship links here operate not only as one of the major forms of symbolic and structural principles of Santal society but also as a medium through which concrete economic activities are organized. But these economic activities are not simple production relations, they have to be viewed in an ecological framework. The value of putting '*mode of production*' into an ecological frame comes from giving due importance to certain 'constraints' with which a given system has to operate. We can identify those constraints in the following manner :

(i) *Climatic constraint*. The low to moderate rainfall in this region coupled with poor soil conditions compel the villagers to become totally dependent upon rainfall for paddy cultivation. So they have to finish agricultural activities within six months after which outmigration of labour from the village would take place.

(ii) *Technoeconomic constraints*. The absence of any kind of irrigation facilities for cultivation as well as persistence of traditional type of plough agriculture could not make way for profit oriented production which would have brought a large non-kin labour force into the village agriculture.

Given these technoenvironmental and economic constraints the Santals of Biridanga fall back upon their kins to carry out their most important economic pursuit. Close kins, rather than distant ones are called for help in agricultural activities, a sort of village unity also comes into relief where most of the cooperating households belong to the village; in fact the whole village operates as kind of genealogically connected unit, although the so called 'nuclear type' predominates the scene. Another interesting aspect of social adaptation is its dual mode of existence. The villagers participate in a cash economy, make transactions even with kins in cash and try to eke out their living by selling their labour against wages to the wealthier regions of Bardhaman and Hooghly where a multicrop agriculture prevails since long

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NOTES AND REFERENCES

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Environmental Effect on Migration : Formation of Satellite Villages in RAR Bengal

MADHUSUDHAN CHATTERJEE

Although from time immemorial the village has been a basic and important unit in the organization of Indian social polity (Dube, 1955) but a fool proof and/or all encompassing definition of the village is yet to find a solid place in the literature of sociology and anthropology. Even the common characteristic features of Indian villages (including tribal) are not yet established with unanimity among the social scientists. Thus we find that the early administrators turned social scientists used to define village more in terms of revenue collecting unit than as a common platform of socio-cultural inter-play. Similarly the social scientists either tried to define village as a self-sufficient unit or to some extent arbitrarily a more or less compact architectural complex (Beteille, 1965). However nobody has ignored the notion of settlement pattern in defining village. In doing so, although they have described the ways in which human population are residentially arranged in a designated territory but little importance were given to the ecological backgrounds in relation to either formation extension or erosion of the village. In fact, social scientists were more centred around the village to collect the considerable information on the society's social structure and pattern of social interaction since these are closely linked with the society's means of production and mechanism of distribution of production. However, technological processes in relation to means of production were little studied in their concrete and detailed operation, despite the fact that these operations are of enormous complexity and vary not only from one region to another, but sometimes within the same district from one village to another.

The differential nature of India's village has so far been viewed at least by anthropologists in terms of castes. But credit goes to Andre Beteille and few others who pointed out the necessity of studying village in terms of agrarian system. And in doing so, they have also considered or prescribed to consider the ecological setting of Indian agriculture which is highly variable in terms of irrigation dependability, topography, humidity, rainfall, sunlight etc. Because all these factors have a direct bearing on the kinds of crops, that can be cultivated and technology employed in their cultivation (Beteille, 1974)

In the above background, the present paper would attempt to highlight the ecological or environmental background of the "Satellite" tribal villages formed by the Santal of Chota Nagpur plateau in the caste dominated region of alluvial Bengal particularly in some parts of Burdwan and Birbhum. The author preferred the term "Satellite" with the fact keeping in mind that these tribal villages have developed centering around caste villages. Moreover, the history of migration and the history of settlement pattern of these "Satellite" tribal villages clearly suggest that they have been formed in accordance to the techno-economic need of the agrarian caste people and they could manage to settle in the periphery or boundary of those caste villages. Thus it is also observed that residents of "Satellite" villages are although techno-economically interrelated with their neighbouring caste people, they are yet to find a well defined and concrete place in the social-cultural milieu of their host caste villagers. In fact, the residents of these

"Satellite" villages are more akin to the legacy of the culture of their home land than to the culture of their new social environment. The reasons of which may be ethnocentrism or sentiment of minority feelings.

The *Santal* residing in the Chota Nagpur plateau are acquainted both with dry farming in the upland areas and wet rice cultivation in the low lying valley regions. Their agriculture is characterised by production of food crops only by means of preindustrial technology and their subsistence level of agricultural economy is supplemented and or complemented with the collection and consumption of minor forest products. (Sachhidananda 1965)

The Santals of Chota Nagpur plateau define their arable lands in terms of the height or location of the land on rugged terrain and on the basis of the water retentivity capacity of those lands as well as their fertility. Thus the lands located on the highest of the slope and with lowest water retentivity capacity is called *Gora* and in some cases *Baid*; the plots located in the medium height and with medium water retentivity capacity are called *Sokra* or *Kanali* and the arable lands located in the lowest region, mostly in the valley regions, are called *Baihar*. It is to be mentioned in this context that different authors have suggested that Baihar land in Chota Nagpur area constitute only ten per cent of the total cultivated land in the region.

The *Gora* or *Baid* lands are mostly filled to produce different varieties of lentils and millets by way of broadcasting method of sowing. However some of the *Baid* plots are also filled to produce paddy by way of broad-casting method. The *Sokra* or *Kanali* plots are only used to cultivate paddy by way of sowing method. Due to limited scope, the details of these technologies could not be described here.

The *Baihar* lands are used to cultivate paddy by way of transplantation method. Because of the highest water retentivity capacity and low-lying position of the plots, the weeding method is essential requirement for paddy cultivation in these category of plots.

The sowing season of cultivation in case of *Baid* and *Sokra* usually ranges from *Jaistha* (May - June) to *Asad* (June - July) whereas the harvesting season in the said two varieties of land ranges from *Ashin* (September - October) to *Kartik* (October - November). But in case of *Baihar*, sowing season ranges from *Sraban* (July - August) to *Bhadra* (August - September) and harvesting season ranges from *Aghrahan* (November - December) to *Paus* (December - January).

The technology of the cultivation in Chota Nagpur area is pre-industrial and/or archaic type in nature and the tillers do not bother to use modern chemical fertilisers and pesticides.

Although the cultivation is the primary occupation of the Santals of Chota Nagpur but small land holdings, lack of irrigation facilities, highly lateritic and infertile land restricts the possibilities of the growth of a vigorous and prosperous peasantry. Moreover, after paying the kinsmen who are assisting the agricultural operation, storing the seeds and managing a meagre amount for exchange with the itinerant traders for salt, tobacco leaf, earthen ware etc. they do not have enough grains in their stock for home consumption. Agricultural activities, leave them with considerable surplus labour time which in past, they tried to utilize through carefully planned exploitation of forest resources. Introduction of different forest bills and acts by the Govt. have

imposed a real threat to their livelihood. The gradual inaccessibility to the forest have compelled them to enchannel their idle labour force in the regions where they could engage themselves for eking out their livelihood. Because their knowledge of wet rice cultivation in the low lying *Baihar* land could allow them to employ in the *Aman* (Monsoon) paddy cultivation in the alluvial track of Bengal. Initially they were in the habit of seasonal migration. Thus the villages, they used to form during the season of transplantation and harvesting were very much temporary in nature. In fact, these temporary settlements were only inhabited by working men and women but not the children and the aged.

But the techno-economic scenery of agriculture in deltaic Bengal gradually changed with the introduction of mechanical device, high yielding variety of seeds, different cash-crops and investment of capital in agriculture. Because of the seasonal but long association over generations, the Santhals were able to adapt themselves with these changed techno-economic scenario which could offer them employment round the year. As a result they began to settle with their families around the multi-caste agrarian villages of Bengal. But their settlement could find little place in the centres of the villages, instead, they were offered the place for residence by their employers at the outskirts of the villages and even sometimes on the banks of the ponds located at the outskirts of the villages. However, in course of time they were also able to purchase some amount of arable lands where they could directly employ their knowledge of newly adopted agrarian technology. Gradually, through the interaction of the Santals with the caste people the techno-economy of agriculture transformed into different levels of social-cultural relationships. However this is yet to take a concrete shape in the level of cultural configuration.

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A Note On Six Blood Group Systems (A₁A₂Bo, Rh, MN, MNS, Kell, Duffy) In A Bengalee Population

A. B. ROYCHOU DHURY, ARUP R. BANDYOPADHYAY AND A. R. BANERJEE

Abstract. In the present study findings on six blood group systems (A₁A₂BO, Rh, MN, MNS, Kell and Duffy) in a Bengalee population of different caste groups comprising 580 individuals (male — 292, female — 288) have been reported. In general similarity between the distributional patterns of blood group systems utilised for the present study with those of published ones on Bengalee population have been noted.

INTRODUCTION

Since the publication of Hirszfeld and Hirszfeld (1919) results of investigation on several million individuals from different parts of the world for different blood group systems have been published (Mourant et al. 1976; Tills et al. 1983). Data on blood group systems of Bengalee population show the abundance for ABO (Mazumder and Rao, 1958; Chatterjee and Mukherjee, 1979; Mazumder and Roy, 1982; Banerjee, 1989; Bandyopadhyay, 1994) in comparison to other systems (Sen, 1962; Walter et al. 1991). Contribution of Chaudhury et al. (1967), Das et al. (1967); Sen (1962); De et al. (1991) and others are laudable in this connection.

On the background of the above in the present paper, an attempt has been made to report the incidence of six blood group systems (A₁A₂BO, Rh CDE, MN, MNS, Kell and Duffy) in a Bengalee population comprising 580 individuals (male - 292, female - 288) of different caste groups of West Bengal, residing in Calcutta.

MATERIAL AND METHOD

Blood samples for the present study were collected in EDTA vials at the Genetic Laboratory Ramakrishna Mission Seva Pratisthan, (Vivekananda Institute of Medical Sciences Calcutta). Samples were collected mainly from expectant mothers and their husbands who were directed to report to the above mentioned laboratory within 2-3 months of pregnancy for routine antenatal check up. Detailed biosocial information including caste affiliation and place of birth of the couples were taken in a specially prepared schedule during the collection of blood samples.

Blood grouping were done following the standard methods (Boorman et al. 1977; Prokop and Gohler, 1986; Spielmann and Kuhl, 1982). For estimation of gene frequencies Maximum Likelihood Estimation as directed by Mourant et al. (1976); Vogel and Motulsky (1986) was followed. Chi² statistics was utilised for goodness-of-fit (Sinnock and Singh, 1972).

RESULT AND DISCUSSION

The phenotypes and gene frequencies of six blood group systems classified according to the

sex are presented in table 1 and 2 respectively. The distribution of all blood group system, excepting the MN system was in good agreement with Hardy-Weinberg equilibrium. Significant deviation from Hardy-Weinberg expectations was found in MN blood group system for both the male ($\chi^2 = 8.23$, 1 d.f. $P < 0.01$) and the female ($\chi^2 = 26.91$, 1 d.f. $P < 0.0001$) as well as in the total population (male + female) ($\chi^2 = 32.29$, 1 d.f. $P < 0.0001$). The above deviation from the genetic equilibrium appears mainly due to surplus of homozygotes and deficit of heterozygotes.

The present data have been compared with other published data on Bengalee population and populations of Eastern India (Chatterjee and Mukherjee, 1979; Walter et al. 1991) and presented in table 3. A close similarity between published data and present sample has been found for the distribution patterns of the six blood group systems.

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Table. 1. Phenotype distribution of six blood group systems in Bengalee population classified according to sex.

System/phenotype		Male	Female	Total (Male + Female)
A₁A₂BO				
	O	99	86	185
	A ₁	62	57	119
	A ₂	10	5	15
	B	106	111	217
	A ₁ B	15	21	36
	A ₂ B	—	8	8
	Total	292	288	580
Rhesus				
	CCDEE	3	1	4
	CCDEe	15	8	23
	CCDee	76	84	160
	CCdde	3	—	3
	CcDEE	3	1	4
	CcDEe	15	18	23
	CcDee	75	72	147
	CcddEe	—	1	1
	Ccddde	—	3	3
	ccDEE	3	3	6
	ccDEe	5	3	8
	ccDee	8	6	14
	ccdde	7	12	19
	Total	213	212	425

System/phenotype		Male	Female	Total (Male + Female)
MN				
	M	148	167	315
	MN	74	61	135
	N	23	28	51
	Total	245	256	501
MNS				
	MMSS	27	41	68
	MMSs	18	19	37
	MMss	103	107	210
	MNSS	11	10	21
	MNSs	18	13	31
	MNss	45	38	83
	NNSS	8	5	13
	NNSs	2	5	7
	NNss	13	18	31
	Total	245	256	501
Kell				
	K+	24	26	50
	K-	242	246	488
	Total	266	272	538
Duffy (fy)				
	Fy (a+b-)	102	104	206
	Fy (a+b+)	129	136	265
	Fy (a-b+)	35	31	66
	Total	266	271	537

Table 2. *Gene frequencies of six blood group systems in Bengalee caste population classified according to sex.*

System/gene	Male	Female	Total
A₁A₂BO			
A ₁	0.143	0.146	0.145
A ₂	0.020	0.027	0.024
B	0.237	0.283	0.260
O	0.560	0.544	0.571
Rh			
cde	0.173	0.218	0.202
Cde	0.000	0.030	0.008
cdE	0.000	0.000	0.000
CdE	0.000	0.000	0.000
cDe	0.076	0.050	0.059
CDe	0.589	0.611	0.588
cDE	0.111	0.101	0.110
CDE	0.051	0.009	0.033
MN			
M	0.755	0.772	0.764
N	0.245	0.228	0.236
MNSS			
MS	0.119	0.143	0.132
Ms	0.598	0.566	0.581
NS	0.071	0.058	0.064
Ns	0.212	0.233	0.223
Kell			
K	0.046	0.049	0.048
k	0.954	0.951	0.952
Duffy (Fy)			
Fy ^a	0.626	0.635	0.631
Fy ^b	0.374	0.365	0.369

Table 3. Comparison of blood group gene frequencies of six blood groups in Bengalee and Eastern Indian population.

SOURCES				
	Bengalee speaking Chatterjee & Mukherjee, 1979)	West Bengal (Walter et al. 1991)	Eastern India (Walter et al. 1991)	Present Study
System/gene	(3360)	(3634)	(10735)	(580)
A ₁ A ₂ BO				
A ₁	0.179	0.177	0.186	0.146
A ₂	0.033	0.023	0.021	0.027
B	0.272	0.267	0.252	0.283
O	0.525	0.533	0.541	0.544
Rn(C,D,E)	(2090)	(3397)	(10265)	(425)
cde	0.148	0.115	0.083	0.202
Cde	0.037	0.015	0.011	0.008
cdE	0.000	0.000	0.003	0.000
CdE	0.000	0.000	0.000	0.000
cDe	0.059	0.066	0.065	0.059
CDe	0.705	0.691	0.715	0.588
cDE	0.093	0.100	0.108	0.110
CDE	0.011	0.013	0.015	0.033
MN	(4034)	(5365)	(12309)	(501)
M	0.626	0.623	0.671	0.755
N	0.374	0.377	0.329	0.245
MNSS	(798)	(1335)	(4758)	(501)
MS	0.159	0.150	0.130	0.119
Ms	0.511	0.528	0.544	0.598
NS	0.091	0.078	0.071	0.071
Ns	0.241	0.244	0.255	0.212
Kell	(219)	(772)	(2292)	(538)
K	0.037	0.167	0.085	0.046
k	0.963	0.833	0.915	0.954
Duffy	(252)	(1201)	(4161)	(537)
Fy ^a	0.386	0.390	0.549	0.369
Fy ^b	0.614	0.610	0.451	0.631

Numbers in the (parenthesis) denotes the sample size

Anthropometric and volumetric study of Indian male swimmers

SATWANTI KAPOOR AND A. K. KAPOOR

Summary : Extremity volumes and 29 body measurements were taken on 30 swimmers and 31 non-swimmers. Mean values of stature, sitting height and weight were found to be higher in swimmers as compared with non-swimmers. Extremity volumes showed high-coefficients with extremity measurements. Regression equations were developed for prediction of extremity volumes.

Lower value of lower extremity (leg) volume in swimmers indicates utility of this measurement in the selection of class swimmers.

INTRODUCTION

Swimming is a type of sport that can be done by people of all ages. Swimming can be performed by techniques such as crawl, back, butterfly and breast strokes. The crawl is mechanically the most efficient type of swimming but people who do not have thorough training find breast stroke easier.

The weight of the body is greatly reduced when submerged in water as density of the body is not very different from that of water. Very little energy is therefore required to keep the body afloat particularly in obese people.

A number of anthropometric and physiological studies have been conducted on competitive swimmers. Gedda et al (1968) observed higher values of biacromial diameter and sitting height in swimmers as compared biacromial diameter have been seen in swimmers indicating that lighter legs that can be held in horizontal position in water are more advantageous in swimming (Rennie et al. 1973). Canadian University class swimmers were measured for various anthropometric variables but the measurements of swimmers were not found to be much different from those of the control group (Shepard et al. 1973).

Since there is little information available on body measurements and extremity volumes of Indian swimmers, the present study was aimed to examine Indian swimmers for a series of body measurements and extremity volumes. An attempt has been made to compare the present sample of Indian swimmers with a group of control subjects (Indian) and also with the swimmers from different parts of the world.

MATERIALS AND METHODS

Thirty male swimmers belonging to the age group 20-40 years were studied. All the swimmers were National participants and had represented India in International Sports in different events of swimming. The present sample included sprint, medium distance event competitors (100-200m) and long distance competitors (400m). They were measured at National Institute of Sports (Delhi) while they were practicing and preparing for various National/International Events. Most of them had been practicing swimming for more than 10 years.

A separate group of 31 adult Indian males who were not the habitual swimmers have been measured for comparison. Most of these subjects belonged to Police forces. Their ages ranged between 23 to 34 years.

Body Measurements

A series of 29 body measurements including weight, stature, sitting height, total leg length, arm length; girths of chest, waist, abdomen, hip, upper arm wrist, thigh, calf and foot; skinfold thicknesses at biceps, triceps, forearm, midaxillary, subscapular, thigh (anterior and posterior) and calf (medial and posterior); diameters - biacromial, shoulder, chest, bitrochanteric and wrist along with chest depth were taken on each subject. All the measurements were taken according to the techniques described by Weiner and Lourie (1969).

Volume measurements

All the subjects were measured for upper extremity (arm) volume and lower extremity (leg) volume by making use of locally fabricated volumeters (Raja et al, 1977).

Reliability of measurements

The techniques were standardised for taking all the measurements before the actual data collection was started. A test-re-test reliability was performed by repeating the experimental procedure on 10 males on two consecutive days. The reliability coefficients for the pairs of measurements taken on two different occasions ranged between 0.70 to 0.99.

RESULTS AND DISCUSSION

The mean age of swimmers (25.8 years) is lower than that of control group (27.8 years). Table 1 shows the mean values and standard deviations of body weight, stature, arm volume, leg volume and a series of different body measurements in swimmers and the control group.

Swimmers were found to be heavier ($\bar{x} = 60.0 \pm 8.8$ kg) than the control group ($\bar{x} = 58.9 \pm 6.4$ kg). Values of chest girth, upper arm girth, thigh girth are much higher in swimmers whereas values of waist girth, wrist girth and foot girth are lower in them as compared to the control group. Most of the skinfold thicknesses have lower values in swimmers. Biacromial and shoulder diameters show higher values in swimmers as compared to the control group. The swimmers are observed to have broad shoulders as it helps in fast swimming. This observation and that of greater sitting height among swimmers are in agreement with the observations of Gedda et al. (1968). Lower values of hip girth among swimmers as compared to the control group is another observation in accordance with the earlier observations that swimmers have sleek bottom (Hukuda and Ishiko, 1966).

The upper extremity (arm) volume does not show any significant difference between the two samples. The lower extremity (leg) volume is much lower in swimmers ($\bar{x} = 0.53 \pm 1.24$ lit) as compared to the control group ($\bar{x} = 10.56 \pm 1.44$ lit). The lower value of leg volume indicates lighter legs in swimmers which could be an advantage for floating to a horizontal position during fast swimming. The observation is in agreement with that of Rennie et al (1973).

Relationship of arm volume with arm measurements Table 2 shows values of correlation coefficient (r) between arm volume and different arm measurements in swimmers and the control group. Upper arm girth shows the highest correlation ($r = 0.70$, $P < 0.001$) with arm volume in swimmers.

Relationship of leg volume with leg measurements Table 3 shows values of correlation coefficient (r) between leg volume and different leg measurements in swimmers and the control group. Thigh girth gave highest correlation ($r = 0.76$, < 0.001) with leg volume in swimmers.

As there is hardly any report available on extremity volumes of swimmers no direct comparisons could be made.

MULTIPLE REGRESSION EQUATIONS

Arm Volume

Stepwise multiple regression analysis was conducted and it was observed that arm volume could be safely predicted by making use of few arm measurements (Table 4). For swimmers, a combination of upper arm girth, skinfold thicknesses at biceps and triceps and arm length gave the best prediction of arm volume ($R = 0.81$, $SEE = 0.32$ lit). In control sample, measurements selected in the best arm volume prediction equation of upper arm girth and wrist girth is $R = 0.77$, $SEE = 0.37$ lit.

Leg Volume

For predicting leg volume of swimmers, measurements selected in the best regression equation were thigh girth, skinfold thickness at calf (medial) and calf girth ($R = 0.81$, $SEE = 0.77$ lit). The best combination of measurements selected for control sample was skinfold thickness at anterior thigh, total leg length and thigh girth giving a value of $R = 0.79$ and $SEE = 0.78$ lit. In both the samples, thigh girth was the common measurement for calculating leg volume.

On comparison with other swimmers, it was observed that Indian swimmers have lower values of different body measurements as compared to the swimmers belonging to other world populations except for the Japanese population. The racial differences reflect general population statistics.

It could be concluded on the basis of present results that body size in particular does not have much significance for selection of swimmers but lower value of lower extremity volume indicates that lighter legs because of their competitive advantage in fast swimming could be used as one of the criteria for the selection of good swimmers.

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Table 1. Mean and standard deviations of different body measurements

Variable	Swimmers (N = 30)			Controls (N = 31)		
	Mean	±	SD	Mean	±	SD
Weight (Kg)	60.0		0.8	58.9		6.4
Stature (cm)	172.7		6.2	172.1		5.1
Sitting height (cm)	88.8		2.6	87.3		2.8
Total leg length (cm)	98.7		4.3	98.5		3.2
Arm length (cm)	74.7		3.4	74.9		4.5
<i>Girth (cm)</i>						
Chest	87.4		4.6	84.5		4.1
Waist	73.3		6.1	74.8		5.2
Abdomen	75.8		6.4	75.9		5.7
Hip	84.3		5.5	95.7		4.4
Upper Arm	26.9		2.0	25.8		2.0
Wrist	16.1		0.8	16.3		0.9
Thigh	48.4		4.1	46.4		3.4
Calf	32.9		2.4	32.1		2.0
Foot	24.2		1.4	24.6		1.5
<i>Skinfold thickness (mm)</i>						
Biceps	3.9		0.8	4.0		1.7
Triceps	6.6		2.0	7.2		2.1
Forearm	5.1		1.3	5.4		1.8
Midaxillary	6.4		2.6	7.4		3.4
Subscapular	9.3		3.0	9.7		3.5
Thigh (anterior)	8.5		5.2	9.0		3.5
Thigh (posterior)	13.4		7.5	11.1		5.0
Calf (medial)	8.3		2.4	9.0		3.7
Calf (posterior)	5.8		1.6	6.8		3.7
<i>Diameter (cm)</i>						
Biacromial	37.0		4.3	35.4		1.4
Shoulder	41.7		2.7	39.9		2.0
Chest	25.8		2.4	25.0		1.4
Chest depth	17.6		1.3	17.6		1.3
Bitrochanteric	27.8		1.7	27.7		1.9
Wrist	4.8		0.3	4.7		0.4
<i>Volume (lit)</i>						
Arm	3.04		0.50	2.99		0.50
Leg	8.53		1.24	10.56		1.44

Table 2 *Relationship between arm volume and arm measurements*

Variable	Correlation coefficient (r) with arm volume	
	Swimmers	Controls
Arm length	0.39*	0.13
Upper arm girth	0.70**	0.57**
Wrist girth	0.60**	0.69**
Biceps skinfold thickness	0.58**	0.23
Triceps skinfold thickness	0.36*	0.35*
Forearm skinfold thickness	0.62**	0.39*
Wrist diameter	0.39*	0.30

* P < 0.05 ** P < 0.001

Table 3. *Relationship between leg volume and arm measurements*

Variable	Correlation coefficient (r) with leg Volume	
	Swimmers	Controls
Total leg length	0.19	0.22
Thigh girth	0.76**	0.59**
Calf girth	0.71**	0.39**
Foot girth	0.34	0.08
Thigh-anterior skinfold thickness	0.40**	0.69**
Thigh-posterior skinfold thickness	0.57**	0.29
Calf-posterior skinfold thickness	0.17	0.28
Calf-medial skinfold thickness	0.58**	0.37*

* P < 0.05 ** P < 0.001

Table 4 *Regression equations for predicting arm volume from arm measurements.*

Subjects	Regression equations Arm volume =	Multiple correlation coefficient 'R'	Standard error of estimate (SEE) liters
Swimmers	-3.8614 + 0.1474 (Upper arm girth) +0.2787 (Skinfold thickness at biceps) +0.0311 (Arm length) — 0.0702 (Skinfold thickness at triceps)	0.81*	0.32
Controls	- 2.8768 + 0.2112 (wrist girth) + 0.0939 (upper arm girth)	0.77*	0.37

* P < 0.001

Table 5. *Regression equations for predicting leg volume from arm measurements.*

Subjects	Regression equations Arm volume =	Multiple correlation coefficient 'R'	Standard error of estimate (SEE) liters
Swimmers	- 3.6559 + 0.1443 (Thigh girth) + 0.1555 (Skinfold thickness at calf-medial) + 0.1310 (Calf girth)	0.81*	0.77
Controls	- 6.0678 + 0.0906 (Skinfold thickness at thigh anterior) + 0.116 (Total leg length) + 0.1047 (Thigh girth)	0.79*	0.78*

* P < 0.001

Table 6. *Physical characteristics of competitive swimmers*

Sample	Stature (cm)	Weight (kg)	Body Fat%	Skinfold (mm) Thickness	Authors
India	172.7	60.0	—	7.5	Present study
Canada Sprint	181.1	75.0	—	10.4	Shephard, Godin, Campbell (1973)
Medium Distance	178.0	74.6	6.9	9.9	Shephard, Godin, Campbell (1973)
Long Distance	179.0	74.9	—	7.5	Shephard, Godin, Campbell (1973)
Czechoslovakia	182.3	79.1	8.5	—	Sprynarove and Parizkova (1971)
Europe	182.5	79.6	—	—	Hukuda and Ishiko (1966)
Japan	170.8	68.7	—	—	Hukuda and Ishiko (1966)
	171.9	70.1	—	—	Ishiko (1967)
	170.1	70.0	—	—	Miyashita et al. (1970)
USA	182.9	78.9	5.0	—	Novak, Hyett, Alexander (1968)
	181.7	73.7	—	—	Dixon and Faulkner (1971)

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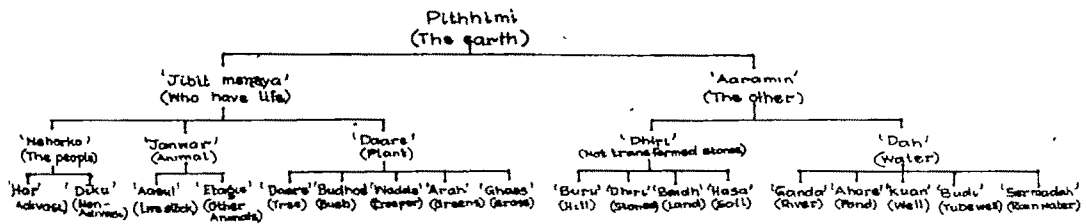


Fig. 4 A Taxonomy of Santal Natural Categories

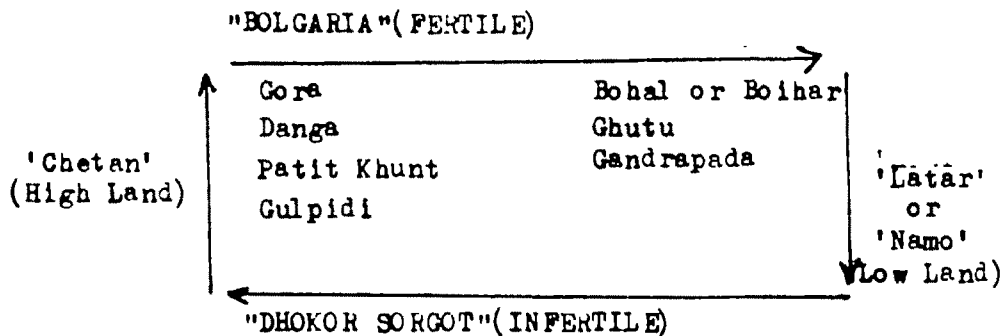


Fig. 5 Paradigm of land types

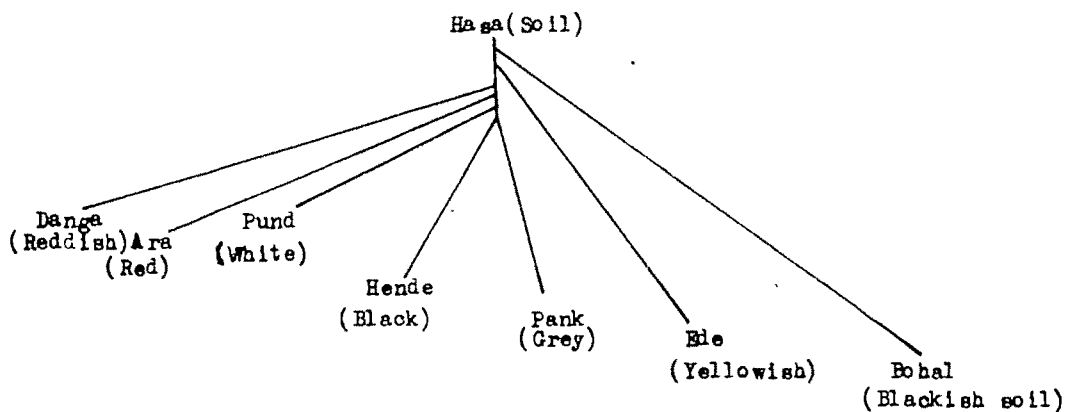


Fig. 6 Tree diagram of soil types

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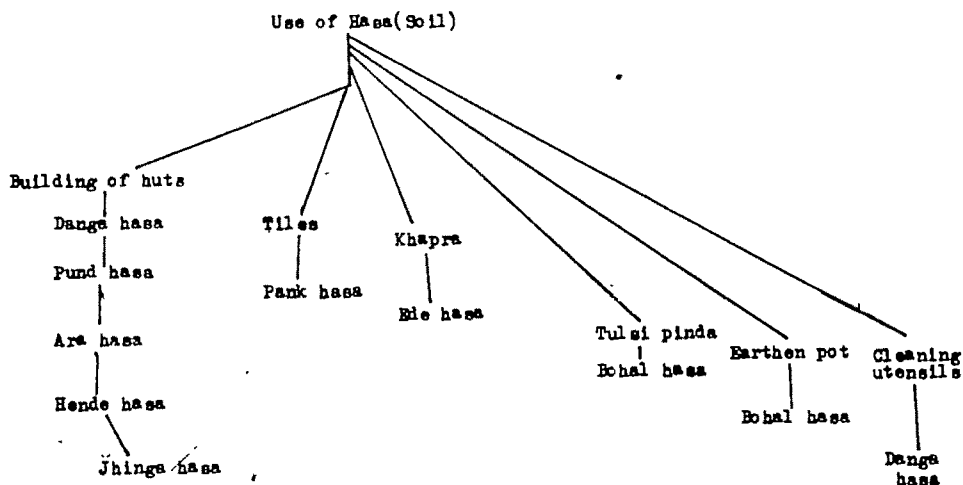


Fig. 8 Use of different types of soil

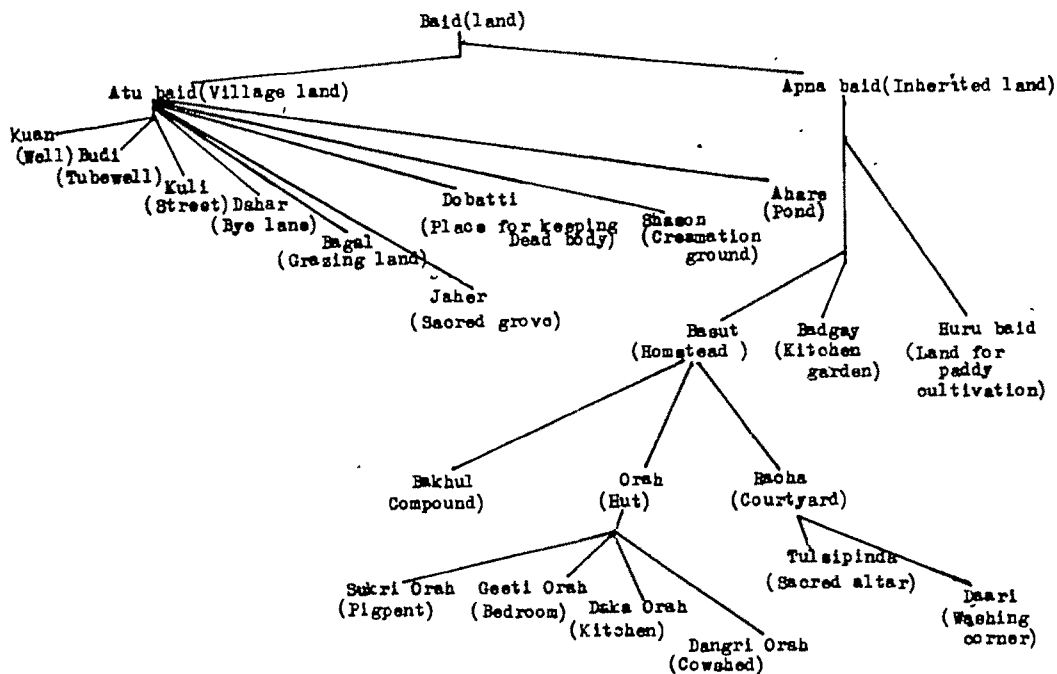
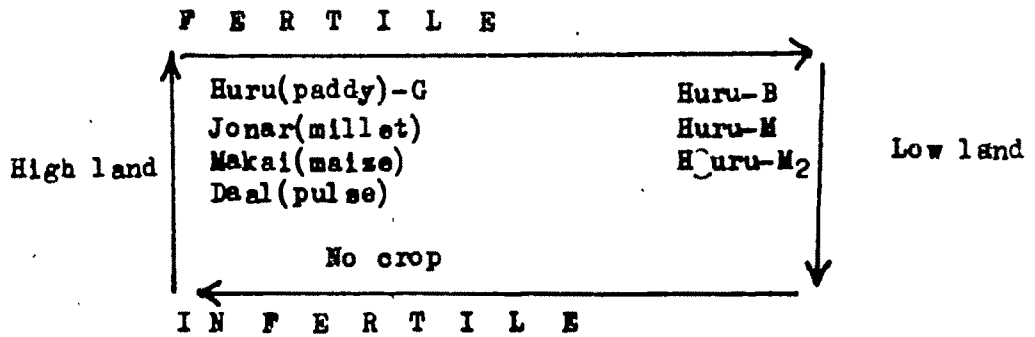


Fig. 9. Classification of land according to the use pattern.

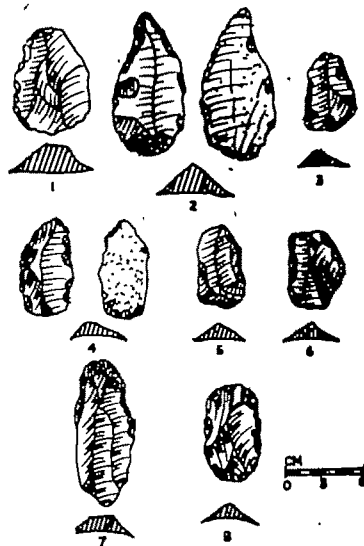
HIERACHICAL CLASSIFICATION OF ENVIRONMENT : SYAMALKANTI SENGUPTA AND DEBASISH GHOSH.



Huru-G Gora
Huru-M Majhi
Huru-M₂ Malto
Huru-B Beramulto, Bhojna, Sitalal, Motichur

Fig 10. Paradigm of crops and land types

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